

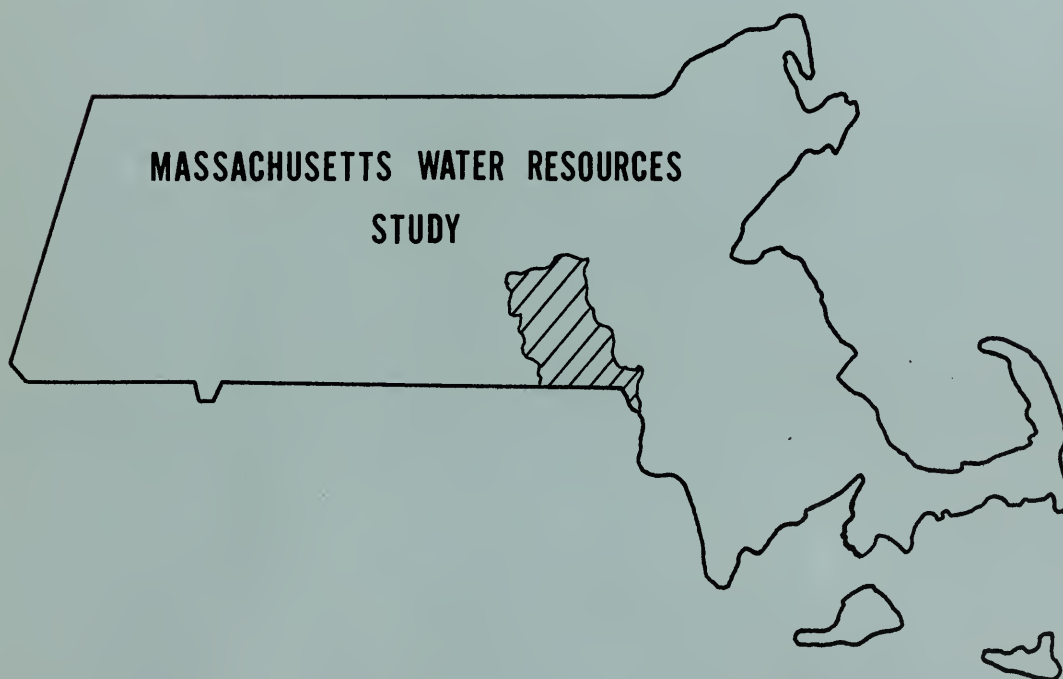
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UNITED STATES DEPARTMENT of AGRICULTURE

INVENTORY
of
POTENTIAL and EXISTING
UPSTREAM RESERVOIR SITES
BLACKSTONE STUDY AREA



U.S. DEPARTMENT of AGRICULTURE
Soil Conservation Service
Economic Research Service
Forest Service

In cooperation with the

MASSACHUSETTS WATER RESOURCES COMMISSION

OCTOBER 1975

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FOREWORD

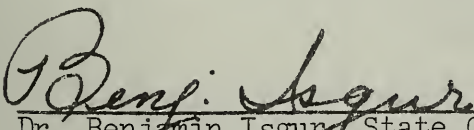
The United States Department of Agriculture, in cooperation with the Massachusetts Water Resources Commission, is participating in the Massachusetts Water Resources Study of the water and related land resources of the Commonwealth. One phase of the study is the inventorying of potential and existing upstream reservoir sites.


The Commonwealth of Massachusetts, through the Water Resources Commission, provides guidance and significant financial contribution toward this phase of the Massachusetts Water Resources Study. The Massachusetts Water Resources Commission, to fulfill its responsibilities under Chapter 21, Sections 8 through 15 of the Massachusetts General Laws, requires technical and engineering data and information on potential upstream reservoir sites. The Department of Agriculture is participating in this study under the provisions of Section 6, of the Watershed Protection and Flood Prevention Act (Public Law-566, 83rd Congress, as amended) which authorizes the Secretary of Agriculture to cooperate with other federal, state and local agencies, in surveys and investigations of the watersheds of rivers and other waterways as a basis for the development of coordinated programs.

This report, prepared by the Soil Conservation Service and submitted by the USDA Field Advisory Committee to the Water Resources Commission, identifies and inventories potential and existing upstream reservoir sites within the Blackstone Study Area.

The Massachusetts Water Resources Commission will use this report, together with other reports and studies prepared by the United States Department of Agriculture and others, in the preparation of a comprehensive plan for the Commonwealth's water and land resources.

The information and data contained herein will also assist local, state and federal agencies in their specific planning activities for the coordinated and orderly conservation, development, utilization and management of the water and land resources to meet the rapidly expanding needs.


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Division of Water Pollution Control
Massachusetts Water Resources Commission

Massachusetts Department of Natural Resources

Soil Conservation Service personnel prepared this report. Richard Pratt was responsible for the development of the engineering phases of the report. David Westerling and Clark Bordeaux collected and processed basic site data. Donald Mills reported on geological conditions. Patricia Cobb typed the final manuscript. James Wesoloski was responsible for editing and publication.

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LEGEND

— STUDY AREA BOUNDARY

LOCATION OF SUB-WATERSHEDS

BLACKSTONE STUDY AREA

MASSACHUSETTS



INVENTORY OF
POTENTIAL AND EXISTING UPSTREAM RESERVOIR SITES
in the
BLACKSTONE STUDY AREA

prepared by the
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

in cooperation with the
MASSACHUSETTS WATER RESOURCES COMMISSION

INTRODUCTION

This report presents data on 90 potential and 101 existing reservoirs in the Blackstone Study Area in Bristol, Middlesex, Norfolk and Worcester Counties in southern Massachusetts near the Rhode Island border. The study area covers about 214,000 acres or 334 square miles. All or portions of 30 cities or towns are located within the study area.

CRITERIA

Potential Reservoir Sites

The primary considerations used to identify potential reservoir sites were suitable topography for a dam and reservoir, sufficient drainage area to maintain the proposed reservoir and a relatively undeveloped pool area.

The following criteria were used as a guide in site selection:

1. Drainage area -- larger than one-half square mile, but not greater than 50 square miles.
2. Ratio of drainage area to beneficial pool area -- not less than 10 to 1.

3. Minimum beneficial pool depth -- 7 feet at the dam.
4. Minimum beneficial pool area -- 10 acres.
5. Minimum beneficial pool capacity -- 100 acre-feet.
6. Maximum beneficial pool capacity-storage volume equal to 25 inches of runoff from the drainage area.
7. Maximum height of dam -- 100 feet.
8. Pool area relatively undeveloped -- no housing developments, industrial areas, or major highways inundated.

Existing Reservoirs

Existing reservoirs were located using the U. S. Geological Survey (USGS) quadrangle sheets and field observation. Two criteria were used to determine sites to be included in this report:

1. Surface area -- at least 10 surface acres or a pond of less than 10 acres, identified by name on the USGS topographic map.
2. Man-made dam -- the pool must be the result of dam construction. Natural ponds and beaver dams are not included.

INVESTIGATIONS AND ANALYSES

Potential Reservoir Sites

Sites were located using the latest available USGS 7½ minute quadrangle sheets. Natural basins, or topography favorable for storage of water, and an undeveloped pool area were the primary considerations in the initial site selection. Watershed boundaries were delineated on the quadrangle sheets and the drainage area was determined for each site. Water storage areas and volumes available upstream of the site center-line were calculated. Data were also obtained to calculate the volume of earthfill required for the dam and any supplementary dikes that might be needed to maintain a reservoir.

At each site a field reconnaissance was made that included an inventory of land and facilities (man-made structures) that would be affected if a dam and reservoir were developed at the site. If it was determined that

the reservoir would flood extensive man-made facilities, or a study of the elevation-area-storage data showed that the site did not meet criteria for the study, the site was dropped from further consideration.

A surficial geologic investigation was made of each potential site to determine any obvious geologic conditions that might affect the waterholding capability or require extensive foundation preparation. A preliminary geological report was prepared which outlined the types of materials that might be expected at the site and their effect on construction costs and waterholding capabilities for the site. The report of geologic conditions was based on the geologist's interpretation following the surficial investigation of the site and surrounding area. No borings were made and subsurface conditions may vary from those indicated in this report.

Hydrologic and hydraulic data were calculated using methods developed by the Soil Conservation Service. Rainfall data were obtained from Technical Papers 40 and 49, U. S. Department of Commerce, Weather Bureau. Preliminary structure site analyses for several levels of development for each site were processed by computer, using a program which determines the most economical type of principal spillway; determines the runoff and peak flow for the 100-year frequency, 10-day duration, principal spillway design storm; routes the design storm to set the emergency spillway crest; performs other routings to determine the design high water and top of dam elevations; calculates embankment yardage and other construction quantities; determines the total estimated cost of the reservoir; and calculates "safe yield" for water supply purposes.

Existing Reservoirs

An inventory was made of 101 existing reservoirs that cover at least ten acres or are identified by name on the USGS quadrangle sheet, and are formed by a man-made dam. The reservoirs were located using the USGS quadrangle sheets. An engineer made a field reconnaissance to determine the physical condition of each structure and to assess the potential for expansion of the reservoir. While at the site, photographs were taken. Selected photographs are included in this report. Ownership and use information for the reservoirs was obtained from records of the Massachusetts Department of Public Works, the Massachusetts Water Resources Commission and from local interviews.

COSTS

Preliminary cost estimates for potential reservoir sites were based on construction costs and land values as of 1974. The cost estimates include:

(1) construction costs; (2) contingencies; (3) engineering and administrative services necessary for surveys, geology, final design, and construction inspection; (4) cost for land required for the reservoir and construction of the dam and spillway; and (5) costs associated with purchase or relocation of man-made facilities affected by the constructed reservoir.

Construction costs were based on recent dam construction contract costs in Massachusetts. A factor for contingencies, equal to 15% to 35% of the construction cost, was included to account for items that were not considered at this intensity of study. Engineering and administrative services ranged from 20% to 40% of the construction cost.

Costs for land acquisition were based on an evaluation of current real estate transactions and market conditions. Land with potential for development was valued at from \$1,000 to \$10,000 per acre; land with little development potential was valued at from \$200 to \$500 per acre. Land values also varied from site to site based on the proximity to developed areas and highways, development taking place in the area, and suitability for development. Land needed for the dam, spillway and design high water pool was included in the land acquisition cost.

Cost estimates are presented on the basis of a cost per acre-foot of storage and cost per surface-acre to provide a comparison between different sites and different levels of development at the same site. Costs are based on preliminary estimates; firm cost estimates for any site can be determined only after completion of detailed geologic and engineering investigations, final structural designs, and land appraisals.

No cost estimates are included for existing reservoirs.

REPORT FORMAT

The report is divided into sections based on the eight subwatersheds in the Blackstone Study Area. The location map, placed after the Table of Contents, outlines the area covered by each subwatershed. To aid local residents in determining which sites are located in their city or town, the Municipal Index of Sites lists the site identification numbers for potential and existing reservoir sites within each municipality and the page number of this report on which data are recorded.

Each subwatershed section provides Site Data for the potential and existing reservoir sites, located within the subwatershed, which are included in this report.

REPORT FORMATPotential Reservoir Sites

Data for potential reservoirs are presented in the following format:

Location: includes a narrative description of the location of the site by reference to nearby roads, railroads, or other physical landmarks. In addition, the latitude, longitude, and USGS quadrangle sheet name are provided for more accurate location.

Facilities Affected: describes any man-made facilities that would be flooded by a reservoir at the potential site. The elevation of existing facilities was estimated during the engineer's field reconnaissance with the aid of the USGS quadrangle sheets.

Geologic Conditions: provides a summary of the preliminary geologic report. The material in the abutments (the valley sides) and the foundation (the valley floor) is described. An estimate is made of the depth to bedrock and the probable type of rock. The availability of fill material which could be used in the dam construction is noted.

Possible leakage problems are indicated and the waterholding capability of the site is subjectively described as "good," "fair," or "poor." The waterholding capability statement is based on the geologist's interpretation of the surficial conditions observed during the field reconnaissance.

Engineering Notes: provides information which should be helpful in preliminary design of a dam. One of the abutments is recommended as the location for an excavated emergency spillway. If an excavated emergency spillway is unable to carry the required flows at safe velocity, the need for a concrete emergency spillway is noted.

Public Ownership: indicates that some portion of a reservoir site is located on land owned by a governmental or quasi-public unit.

Sites which meet study criteria have been analyzed using a computer program which develops preliminary structure site analyses for several levels of beneficial pool. Results of the computer program are presented in the tables entitled, "Summary Data for Potential Upstream Reservoir Sites" at the end of each subwatershed section. Two information lines contain data on site drainage area, USGS quadrangle name

on which the site is located, latitude and longitude of the site, site rating, stream water quality, and principal spillway design storm runoff and peak flow. The site rating is based on geologic conditions and the expected waterholding capability. Sites are given one of the following ratings:

1. Suited for deep permanent storage (over 10 feet in depth).
2. Best suited for shallow water storage (3 to 5 feet maximum depth).
3. Best suited for temporary storage (e.g., floodwater and sediment storage).

In order to furnish the most data for potential reservoir sites, each site was considered to be suitable for deep permanent storage (rating "1") for purposes of design and analyses. The rating for any site could change based on detailed geologic investigations.

Stream water quality ratings are based on classifications assigned by the Division of Water Pollution Control, Massachusetts Water Resources Commission, and published in "Water Quality Standard," June 1967, and are as follows:

- "Class A -- Waters designated for use as public water supply in accordance with Chapter lll of the General Laws. Character uniformly excellent.
- "Class B -- Suitable for bathing and recreational purpose including water contact sports. Acceptable for public water supply with appropriate treatment.
Suitable for agricultural, and certain industrial cooling and process uses; excellent fish and wildlife habitat; excellent aesthetic value.
- "Class C -- Suitable for recreational boating; habitat for wildlife and common food and game fishes indigenous to the region; certain industrial cooling and process uses; under some conditions acceptable for public water supply with appropriate treatment. Suitable for irrigation of crops used for consumption after cooking. Good aesthetic value.
- "Class D -- Suitable for aesthetic enjoyment, power, navigation, and certain industrial cooling and process uses. Class "D" waters will be assigned only where a higher water use class cannot be attained after all appropriate waste treatment methods are utilized."

The Summary Data for Potential Upstream Reservoir Sites tables also contain data for as many as six possible levels of development at each site. Elevations of the beneficial pool, emergency spillway crest, design high water, and top of dam are shown along with pertinent storage volumes, surface areas and depths. Total cost expressed in dollars

per acre-foot of storage and dollars per surface-acre are provided to aid in comparison of levels of development. The emergency spillway type which was used in the preliminary design is indicated by an emergency spillway type code explained in the table notes.

These tables are photo-reductions of the computer output sheets. Elevations are shown to the tenth of a foot and costs to the nearest \$10, but are not to be considered that accurate because of the limited investigations made with preliminary data. All the Summary Data Tables are based on preliminary reconnaissance-type investigations and computer-produced structure designs. Additional detailed engineering, geologic and design investigations must be made before final site selection, land acquisition and final design would be practical.

Estimated safe yield for each potential reservoir are also shown on the tables and were based on information extrapolated from data developed by Professor G. R. Higgins, Civil Engineering Department, University of Massachusetts. These estimated safe yields are based on a 95% chance, or the minimum yield that could be expected 19 years out of 20 -- taking into consideration reservoir storage-volume and expected runoff. These data do not consider evaporation, seepage, or prior upstream usage losses.

The Committee on Rainfall and Yield of Drainage Areas of the New England Water Works Association has recommended a figure of 600,000 gallons per day per square mile as a maximum economically feasible safe yield. Data for some of the potential sites in this report show a safe yield above 600,000 gallons per square mile per day. These higher values are useful to define the upper portion of a discharge-storage curve for preliminary analysis. For detailed evaluation of a potential site for water supply purposes, the recommendation of the New England Water Works Association should be considered.

Existing Reservoirs

Site data for existing reservoir sites are presented in the following format:

Location: of the dam is indicated by reference to nearby roads, railroads, or other physical landmarks. The appropriate USGS quadrangle sheet, latitude, and longitude are provided for more accurate location.

Physical data (surface area, height of dam, and drainage area) were estimated from the quadrangle sheet and by field reconnaissance.

Potential
for

Expansion: Potential is estimated and any major man-made facilities which would be affected by an enlarged reservoir are noted. Some of the site narratives contain the phrase, "Significant expansion does not appear practical." The phrase is used to indicate that although the pool level might be raised by a few feet or the pool area increased by a few acres, any greater expansion does not appear feasible due to topography or facilities which would be flooded.

In some instances, the drainage area of the reservoir does not meet the criteria requiring a 10 to 1 drainage area to pool area ratio, below which there may be relatively high evaporation losses. An increase in reservoir surface area might increase evaporation losses to a point where the reservoir could not be maintained during the summer months. These situations are indicated by the statement, "The small drainage area limits expansion potential."

Remarks: includes a description of the dam and spillway system. Construction materials, spillway type and size, and condition of the structure are noted.

Ownership
and

Use: is indicated, if available. In some cases, the pool is not maintained for a specific purpose, but may have incidental use for recreation. This is probably the situation for existing reservoirs which are indicated in the Massachusetts Department of Public Works records as being used to "store water." Typical of these sites are old mill dams which are no longer utilized for mill power.

Selected photographs of existing dams, spillways, and reservoirs are included in the report.

MAPS

Individual subwatershed maps appearing at the end of each section indicate the location of the potential and existing reservoir sites in that subwatershed. The maps are reductions of mosaics prepared from 7½ minute USGS quadrangle sheets (1" = 2000' scale). The quadrangle sheets used and publication dates are listed on the maps. Potential sites are indicated with a red rectangle surrounding the site number. Existing reservoirs are identified by a red circle surrounding the site number.

BLACKSTONE STUDY AREA
SITE DATA FOR

Subwatershed BL-61, Ramshorn Brook

The Ramshorn Brook subwatershed covers about 33,400 acres in Auburn, Holden, Leicester, Millbury, Oxford, Paxton, Sutton, and Worcester; all in Worcester County.

The subwatershed is comprised of several brooks which join to form the Middle River in Worcester. Major streams in the subwatershed include Kettle, Tatnuck, Dark and Ramshorn Brooks.

Geology of the potential reservoir sites is characterized by 10 to 20 feet of glacial till, englacial drift, or outwash sand and gravel underlain by granitic gneiss or schist bedrock.

Nine potential reservoir sites and 23 existing reservoirs were studied.

POTENTIAL SITE BL-6102

Location: On the Cascade tributary to Tatnuck Brook about 1,000 feet upstream from Cataract Street in Worcester, Mass.

Worcester North, Mass. USGS quadrangle

Latitude: 42°17'05" Longitude: 71°52'01"

Facilities Affected: None below elevation 800

Geologic Conditions: Both abutments are englacial drift and glacial till. Depth to schist bedrock in the foundation is estimated to be from 10 to 20 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6103

Location: On an unnamed tributary to Ramshorn Pond about 500 feet upstream from Davis Road in Millbury, Mass.

Worcester South, Mass. USGS quadrangle

Latitude: 42°09'23" Longitude: 71°48'48"

Facilities None below elevation 670
Affected:

Geologic Conditions: The left abutment is outwash sand and gravel with dense glacial till high on the slope. The right abutment is thin discontinuous englacial drift underlain by granitic gneiss. Granitic gneiss bedrock outcrops in the foundation. Water-holding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6104

Location: On an unnamed tributary to Ramshorn Pond about 800 feet upstream from Griggs Road in Sutton, Mass.

Worcester South, Mass. USGS quadrangle

Latitude: 42°08'53" Longitude: 71°48'47"

Facilities None below elevation 665
Affected:

Geologic Conditions: The left abutment is thin discontinuous englacial drift underlain by schist bedrock. The right abutment is dense glacial till, shallow to schist bedrock, with a swamp terrace low on the slope. Depth to schist bedrock in the foundation is estimated to be from 10 to 15 feet. Water-holding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6106

Location: On Ramshorn Brook about 2,200 feet upstream from the Auburn-Millbury town line in Millbury, Mass.

Worcester South, Mass. USGS quadrangle

Latitude: 42°11'09" Longitude: 71°48'27"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	2 Houses	570
	4 Sheds	570
	House	560
	Gas Line	560
	Carleton Road	560
	House	555
	Shed	535
	Stowe Road	535

Geologic Conditions: Both abutments are thin discontinuous englacial drift underlain by granitic gneiss. Granitic gneiss bedrock outcrops in the foundation. Waterholding capabilities appear to be good. Borrow material for dam construction was not located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6107

Location: On an unnamed tributary to Kettle Brook about 700 feet upstream from Auburn Street in Leicester, Mass.

Leicester, Mass. USGS quadrangle

Latitude: 42°14'17" Longitude: 71°52'54"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	Power Line poles	755

Geologic Conditions: The left abutment is dense glacial till. The right abutment is outwash sand and gravel. Depth to granitic gneiss bedrock in the foundation is estimated to be from 5 to 15 feet. Waterholding capabilities appear to be poor. Leakage is expected through the foundation and right abutment. Previous borrow material for dam construction was located near the site; impervious material was not located.

Engineering Notes: Neither abutment is suitable for the excavated emergency spillway location. A concrete emergency spillway may be needed at this site.

POTENTIAL SITE BL-6109

Location: On an unnamed tributary to Stoneville Reservoir about 1,100 feet southeast of the Auburn-Leicester town line and about 3,700 feet southwest of the intersection of Leicester and Rochdale Streets in Auburn, Mass.

Leicester, Mass. USGS quadrangle

Latitude: $42^{\circ}12'14''$

Longitude: $71^{\circ}52'31''$

Facilities Affected: None below elevation 770.

Geologic Conditions: Both abutments are dense glacial till with cobbles and boulders. Depth to schist bedrock in the foundation is estimated to be from 25 to 30 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6110

Location: On Ramshorn Brook in Pondville Pond about 1100 feet downstream from the Auburn-Millbury town line in Auburn, Mass.

Worcester, South, Mass. USGS quadrangle

Latitude: $42^{\circ}11'27''$

Longitude: $71^{\circ}48'53''$

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	2 Houses	570
	5 Sheds	570
	Carleton Road	560
	House	555
	Gas Line	555
	2 Houses	550
	House	540
	House	535
	Shed	535
	Old Common Road	535
	Stowe Road	535

POTENTIAL SITE BL-6110 (cont'd)

Geologic Conditions: Both abutments are outwash sand and gravel near the toe of the slope with dense glacial till high on the slope. Depth to granitic bedrock in the foundation is estimated to be from 15 to 20 feet. Waterholding capabilities appear to be fair to poor. Leakage is expected through the sand terrace in the foundation. Borrow material for dam construction was located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6111

Location: On Stone Brook about 1,000 feet upstream of Elm Street in Auburn, Mass.

Worcester, South, Mass. USGS quadrangle

Latitude: 42°10'57" Longitude: 71°49'26"

Facilities Affected: None below elevation 540.

Geologic Conditions: Both abutments are outwash sand and gravel. The left abutment is composed primarily of fine sand. Depth to bedrock in the foundation is estimated to be from 10 to 15 feet. Waterholding capabilities appear to be poor. Leakage is expected through both abutments. Pervious borrow material for dam construction was located near the site; impervious material was not located.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6112

Location: On Ramshorn Brook about 100 feet downstream of Carleton Road in Millbury, Mass.

Worcester, South, Mass. USGS quadrangle

Latitude: $42^{\circ}10'51''$

Longitude: $71^{\circ}47'53''$

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	4 Houses	580
	Shed	580
	3 Houses	575
	Garage	575
	Vacant Factory	575
	West Main Street	575
	2 Houses	570
	4 Sheds	570
	2 Houses	565
	Shed	565
	Stowe Road	560
	Carleton Road	560
	Gas Line	555

Geologic Conditions: Both abutments are dense glacial till; probably shallow to bedrock. Granitic gneiss bedrock outcrops high on the left abutment. Depth to bedrock in the foundation is estimated to be from 15 to 20 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located about one-half mile from the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

SUMMARY DATA FOR POTENTIAL UPSTREAM RESERVOIR SITES

15

STUDY AREA-BLACKSTONE RIVER									
SUBWATERSHED RAMSHORN BROOK									
BENEFICIAL POOL									
ELEV	STORAGE	COST PER AC FT	AREA (AC)	COST SURF AC (\$)	DEPTH AT DAM (FT)	CREST ELEV	STORAGE AT CREST	COST PER AC FT (\$)	DESIGN HIGH WATER
(MSL)	AC FT IN	(AC)	(AC)	(AC)	(FT)	++ TYPE (MSL)	AC FT IN	(AC)	(MSL) (AC) (MSL) (AC)
DA= 0.60 SQ MI = 384 AC									
STREAM WATER QUALITY (B) 100-YR PRIN SPWY DESIGN STORM									
LATITUDE 42-17-05 LONGITUDE 71-52-01									
RUNOFF = 7.30 IN, PEAK FLOW = 251 CFS									
SITE-BL-6102									
SITE RATING (1)									
778.5	0	0.0	2	28450	4.5	787.3	133	4.1	789.7
786.3	100	3.0	27	28450	12.3	788.8	185	5.8	791.2
788.2	157	4.9	34	24690	14.2	790.7	258	8.0	793.0
789.8	215	6.6	40	22290	15.7	792.3	324	10.1	794.5
792.5	329	10.3	44	22950	18.5	795.0	447	14.0	797.2
792.5	331	10.3	44	23000	18.5	795.0	448	14.0	797.2
SITE-BL-6103									
SITE RATING (2)									
650.0	0	0.0	2	8680	10.1	656.8	155	4.1	659.9
655.5	100	2.7	35	6970	15.6	658.0	211	5.6	661.3
657.8	195	5.1	48	6970	17.7	660.3	339	9.1	662.9
659.5	291	7.8	59	6210	19.6	662.0	458	12.3	664.3
662.5	479	12.8	72	5950	22.5	665.0	678	18.2	666.7
SITE-BL-6104									
SITE RATING (1)									
635.7	0	0.0	6	24160	1.7	645.0	177	4.1	649.4
642.2	100	2.3	23	12560	8.2	642.2	106	2.5	653.3
648.0	261	6.1	33	10960	14.0	650.5	358	8.3	654.9
655.4	583	13.7	55	10960	21.4	657.9	739	17.2	660.9
662.5	1060	24.9	81	10560	28.5	665.0	1284	30.0	666.8

NOTES -

- (1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.
- (2) EMERGENCY SPILLWAY STORAGE AND COSTS ARE BASED ON TOTAL STORAGE, INCLUDING BENEFICIAL POOL.
- (3) EMERGENCY SPILLWAY TYPE CODE- C=CONCRETE CHUTE, D=CONCRETE DROP, E=EXCAVATED, T= TWO SPILLWAYS, N= NONE
- (4) TABULAR DATA ARE BASED ON PRELIMINARY INFORMATION. FIGURES SHOWN ARE PRIMARILY FOR COMPARISON PURPOSES.
- (5) ELEVATIONS ARE SHOWN TO THE NEAREST 0.1 FOOT TO SHOW VARIATION BETWEEN DEVELOPMENTS ONLY, AND ARE NOT TO BE CONSIDERED ACCURATE TO THAT DEGREE.

** DO NOT USE FOR FINAL SITE SELECTION OR LAND ACQUISITION. **

STUDY AREA-BLACKSTONE RIVER SUBWATERSHED RAMSHORN BROOK

NOTES - (1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.
(2) EMERGENCY SPILLWAY STORAGE AND COSTS ARE BASED ON TOTAL STORAGE, INCLUDING BENEFICIAL POOL.
(3) EMERGENCY SPILLWAY TYPE CODE- C=CONCRETE CHUTE, D=CONCRETE DROP, E=EXCAVATED, T= TWO SPILLWAYS, N= NONE
(4) TABULAR DATA ARE BASED ON PRELIMINARY INFORMATION. FIGURES SHOWN ARE PRIMARILY FOR COMPARISON PURPOSES.
(5) ELEVATIONS ARE SHOWN TO THE NEAREST 0.1 FOOT TO SHOW VARIATION BETWEEN DEVELOPMENTS ONLY, AND ARE NOT TO BE CONSIDERED ACCURATE TO THAT DEGREE.

DO NOT USE FOR FINAL SITE SELECTION OR LAND ACQUISITION.

SUBWATERSHED RAMSHORN BROOK

STUDY AREA-BLACKSTONE RIVER										SUBWATERSHED RAMSHORN BROOK									
BENEFICIAL POOL					EMERGENCY SPILLWAY					DESIGN					DAM				
ELEV	STORAGE	COST PER AC FT	AREA (AC)	COST/ SURF AC	DEPTH AT DAM	CREST ELEV	STORAGE AT CREST	COST PER AC FT	TOP ELEV	FILL VOL (1000 CY)	PERCENT CHANCE	YIELD AT 95							
(MSL)	AC FT IN	(\$)	(AC)	(\$)	(FT)	(MSL)	AC FT IN	(\$)	(MSL)	(AC)	(MSL)	FT CY							
DA= 4.80 SQ MI = 3072 AC										LATITUDE 42-11-27 LONGITUDE 71-48-53									
STREAM WATER QUALITY (B)										RUNOFF = 7.30 IN, PEAK FLOW = 1654 CFS									
100-YR PRIN SPWY DESIGN STORM										* * * * *									
513.5 0 0.0										535.5 E 1435 5.6 640 * 538.0 109 * 541.0 31 73 * * * * *									
517.2 100 0.4										519.7 E 241 0.8 1880 * 522.0 58 * 525.0 15 14 * 0.36									
533.0 1150 4.5										545.5 E 2593 10.1 560 * 547.9 140 * 550.9 41 144 * 1.75									
550.4 3250 12.7										556.9 E 4505 17.6 570 * 559.3 250 * 562.3 52 274 * 3.03									
564.0 6400 25.0										566.5 E 7256 28.2 560 * 569.0 378 * 572.0 62 433 * 3.99									
* * * * *										* * * * *									
SITE-BL-6111					SITE-BL-6111					SITE-BL-6111					SITE-BL-6111				
SITE RATING (3)					SITE RATING (3)					SITE RATING (3)					SITE RATING (3)				
DA= 1.60 SQ MI = 1024 AC					USGS QUAD-WORCESTER SOUTH					LATITUDE 42-10-57 LONGITUDE 71-49-26					668 CFS				
STREAM WATER QUALITY (B)					100-YR PRIN SPWY DESIGN STORM					RUNOFF = 7.30 IN, PEAK FLOW =					* * * * *				
517.0 0 0.0					529.0 E 354 4.1 1140 * 531.5 66 * 534.5 21 24 * * * * *					534.5 21 24 * * * * *									
523.0 100 1.2					529.5 E 382 4.5 1280 * 532.0 70 * 535.0 21 26 * 0.26					535.0 21 26 * 0.26									
526.3 209 2.4					530.8 E 452 5.3 1200 * 533.2 77 * 536.2 22 28 * 0.41					536.2 22 28 * 0.41									
528.5 318 3.6					531.0 E 474 5.6 1220 * 533.5 79 * 536.5 23 29 * 0.53					536.5 23 29 * 0.53									
532.3 535 6.3					534.8 E 745 8.7 920 * 537.2 101 * 540.2 26 46 * 0.70					540.2 26 46 * 0.70									
532.5 553 6.5					535.0 E 766 9.0 920 * 537.5 102 * 540.5 26 49 * 0.72					540.5 26 49 * 0.72									
* * * * *					* * * * *					* * * * *					* * * * *				
SITE-BL-6112					SITE-BL-6112					SITE-BL-6112					SITE-BL-6112				
SITE RATING (1)					SITE RATING (1)					SITE RATING (1)					SITE RATING (1)				
DA= 4.30 SQ MI = 2752 AC					USGS QUAD-WORCESTER SOUTH					LATITUDE 42-10-51 LONGITUDE 71-47-53					1377 CFS				
STREAM WATER QUALITY (B)					100-YR PRIN SPWY DESIGN STORM					RUNOFF = 7.30 IN, PEAK FLOW =					* * * * *				
554.3 0 0.0					569.5 E 1491 6.5 460 * 572.0 161 * 575.8 24 24 * * * * *					575.8 24 24 * * * * *									
556.8 100 0.4					569.3 E 1446 6.3 480 * 571.8 159 * 574.8 23 21 * 0.35					574.8 23 21 * 0.35									
561.5 471 2.0					572.0 E 1873 8.2 470 * 574.5 174 * 577.8 26 33 * 1.00					577.8 26 33 * 1.00									
567.9 1212 5.3					567.9 T 1246 5.4 830 * 574.9 175 * 577.9 26 33 * 1.71					577.9 26 33 * 1.71									
572.5 1901 8.3					572.5 T 1935 8.3 660 * 577.5 189 * 580.5 28 59 * 2.23					580.5 28 59 * 2.23									
* * * * *					* * * * *					* * * * *					* * * * *				

NOTES - (1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.

- (2) EMERGENCY SPILLWAY STORAGE, DESIGN CRITERIA AND COST DATA.
(3) EMERGENCY SPILLWAY TYPE CODE- C=CONCRETE CHUTE, D=CONCRETE DROP, E=EXCAVATED, T= TWO SPILLWAYS, N= NONE INCLUDING BENEFICIAL POOL.
(4) TABULAR DATA ARE BASED ON PRELIMINARY INFORMATION. FIGURES SHOWN ARE PRIMARILY FOR COMPARISON PURPOSES.
(5) ELEVATIONS ARE SHOWN TO THE NEAREST 0.1 FOOT TO SHOW VARIATION BETWEEN DEVELOPMENTS ONLY, AND ARE NOT CONSIDERED ACCURATE TO THAT DEGREE.

DO NOT USE FOR FINAL SITE SELECTION OR LAND ACQUISITION.

Existing Site BL-6114 (Holden Reservoir #1)

Location: On Tatnuck Brook about 4,800 feet upstream from the Worcester-Holden boundary in Holden, Mass.

Worcester North and Paxton, Mass. USGS quadrangles

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	(Sq. Mi.)
<u>125</u>	<u>30</u>	<u>3,000</u>	<u>4.7</u>

Potential for Expansion: It appears that the present pool level could be raised at least 50 feet without affecting facilities other than Reservoir Street and South Road. The relatively small drainage area might limit expansion of this magnitude.

Remarks: The dam is an earthfill structure. The spillway is a granite block weir about 30 feet wide and 8 feet deep. The downstream face of the spillway is stepped and discharges into a paved chute. A gate house is located on the left abutment. The entire structure is in good repair.

Ownership and Use: The Reservoir is owned by the city of Worcester and is used as a water supply.

Existing Site BL-6115 (Holden Reservoir #2)

Location: On Tatnuck Brook about 1,100 feet upstream from the Worcester-Holden boundary in Holden, Mass.

Worcester North, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>55</u>	<u>40</u>	<u>3,550</u>	<u>5.5</u>

Potential for Expansion: Reservoir #1 (Site BL-6114) is located immediately upstream from Reservoir #2. Any expansion of Reservoir #2 would affect the upstream site. There appears to be potential for combining the two sites into one reservoir with additional storage capacity than available at present.

Remarks: The dam is an earthfill structure. The spillway is a weir about 50 feet wide and 6 feet deep. Spillway walls are constructed of granite blocks. The weir and outlet channel are concrete. The dam and spillway are in good condition. Concrete in the spillway chute has some minor cracks.

Existing Site BL-6115(Holden Reservoir #2) cont'd

Ownership The reservoir is owned by the city of Worcester and is
and used as a water supply.

Use:

Existing Site BL-6116 (Cook Pond) (Thayer Pond)

Location: On Tatnuck Brook about 1,700 feet upstream from Mower
Street in Worcester, Mass.

Worcester North, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>25</u>	<u>20</u>	<u>4,750</u>	<u>7.4</u>

Potential The pond is surrounded by streets and houses which limit
for any significant expansion. A much longer dam would be
Expansion: needed.

Remarks: The dam is an earthfill structure. The spillway is a
weir about 50 feet wide and 5 feet deep. Spillway walls
are constructed of placed rock. The weir is concrete-
capped stone. Large trees are growing on the dam. There
is some erosion adjacent to the spillway,

Ownership The pond is owned by Smith Pond, Inc. and is used for
and recreation.

Use:

Existing Site BL-6117 (Patch Reservoir)

Location: On Tatnuck Brook about 1,700 feet upstream from June Street in Worcester, Mass.

Worcester North, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>35</u>	<u>8</u>	<u>6,500</u>	<u>10.2</u>

Potential for Expansion: The reservoir is surrounded by streets and houses which limit any significant expansion. Topography limits any significant increase in surface area.

Remarks: The dam is a stone weir structure. The weir is about 60 feet wide 4 feet deep, and is capped with concrete. The dam appears to be in good condition

Ownership and Use: The reservoir is owned by the city of Worcester and is used for recreation.

Existing Site BL-6118 (Patch Pond)

Location: On Tatnuck Brook about 500 feet upstream from June Street in Worcester, Mass.

Worcester North, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Miles)
<u>7</u>	<u>15</u>	<u>6,650</u>	<u>10.4</u>

Potential for Expansion: The pond is surrounded by streets and houses which limit any significant expansion. Topography limits significant increase in surface area.

Remarks: The dam is an earthfill structure with vertical stone walls on both faces. The spillway is a concrete weir about 50 feet long and 3 feet deep. The remains of a concrete spillway are located near the left abutment. Large trees are growing on the dam. Concrete in the spillway is cracked and broken. Dam and spillway are in poor condition.

Ownership and Use: The pond is owned by the city of Worcester and is no longer used. According to county records, the dam was breached.

Existing Reservoir BL-6119 (Coes Reservoir)

Location: On Tatnuck Brook about 1,600 feet upstream from Routes 9 and 12 in Worcester, Mass.

Worcester North, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>90</u>	<u>30</u>	<u>7,500</u>	<u>11.7</u>

Potential for Expansion: The reservoir is surrounded by streets and houses which limit any significant expansion. Topography limits any significant increase in surface area.

Remarks: The dam is an earthfill structure with a mill building directly downstream. The spillway is a weir about 50 feet long and 6 feet deep discharging to a rock-lined chute.

Ownership and Use: The reservoir is owned by Coes Wrench Company and is used for recreation.

Existing Site BL-6120 (Coes Pond)

Location: On Tatnuck Brook about 200 feet upstream from Routes 9 and 12 in Worcester, Mass.

Worcester North and Worcester South, Mass. USGS quadrangles

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>7</u>	<u>15</u>	<u>7,550</u>	<u>11.8</u>

Potential for Expansion: The pond is surrounded by streets and building which limit any significant expansion. Coes Reservoir (Site BL-6119) is located immediately upstream.

Remarks: The dam is a granite block weir. The spillway is about 50 feet long, 6 feet deep, and leads to a series of granite steps in the outlet channel. The weir crest is capped with concrete.

Ownership and Use: The pond is owned by Coes Knife Company and is used for industrial purposes and recreation.

Existing Site BL-6121 (Curtis Ponds)

Location: On Kettle Brook at Webster Square in Worcester, Mass.

Worcester South, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>63</u>	<u>15</u>	<u>20,600</u>	<u>32.2</u>

Potential for Expansion: The ponds are surrounded by streets, buildings, railroads and cometeries which limit expansion.

Remarks: The dam is a granite block weir. The spillway is about 85 feet wide, 5 feet deep, and discharges to a stepped chute.

Ownership and Use: The ponds are owned by Massachusetts Electric Company and are used for power plant cooling water.

Existing Site BL-6122 (Leesville Pond)

Location: On Kettle Brook about 200 feet upstream from Oxford Street in Worcester, Mass. Most of the reservoir is in Auburn, Mass.

Worcester South, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>60</u>	<u>15</u>	<u>17,600</u>	<u>27.5</u>

Potential for Expansion: The pond is surrounded by streets, houses, and a railroad which limit expansion. A cemetery is located on an island in the center of the pond.

Remarks: The dam is an earthfill structure. The upstream face is vertical concrete walls and rock riprap. The principal spillway is a concrete weir about 75 feet long and 4 feet deep with a rock-lined basin to dissipate energy. A concrete side-channel spillway on the right abutment is controlled by a gate. The spillway has 2 bays, each about 5 feet wide and 5 feet deep. Brush is growing on the downstream slope of the dam. Concrete is in good condition.

Ownership and Use: The pond is owned by Erv Jacobson and is used for water storage and recreation.

Existing Site BL-6123 (Stoneville Pond)

Location: On Kettle Brook at Oxford Street in Auburn, Mass.

Worcester South, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>35</u>	<u>12</u>	<u>9,350</u>	<u>14.6</u>

Potential for Expansion: The reservoir is surrounded by streets, houses, and a railroad which limit expansion.

Remarks: Oxford Street forms the dam. The principal spillway is two concrete ogee weir sections each about 60 feet long and 4 feet deep. An auxiliary spillway under Oxford Street has been filled in and is no longer functional.

Ownership and Use: The pond is owned by Massachusetts Electric Company and is used as a water storage reservoir.

Existing Site BL-6124 (Stoneville Reservoir)

Location: On an unnamed tributary to Kettle Brook about 2,000 feet upstream from Rochdale Street in Auburn, Mass.

Worcester South, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Miles
<u>75</u>	<u>15</u>	<u>2,050</u>	<u>3.2</u>

Potential for Expansion: The reservoir is surrounded by streets, houses, and a railroad which limit expansion.

Remarks: The dam is an earthfill structure. The principal spillway is a concrete ogee weir section about 25 feet long and 4 feet deep. Part of the principal spillway is a gate-controlled concrete structure about 10 feet wide and 3 feet deep. A dike on the left abutment has vertical faces of placed stone. The left end of the dike is an emergency spillway about 25 feet long and 5 feet deep with granite side walls. Concrete in the principal spillway is cracked and broken in places.

Ownership and Use: The reservoir is owned by Massachusetts Electric Company and is used as a water storage reservoir.

Existing Site BL-6125 (Pondville Pond)

Location: On Ramshorn Brook at Route 20 in Auburn, Mass. about one-quarter of the pond is in Millbury, Mass.

Worcester South, Mass, USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Miles
<u>30</u>	<u>20</u>	<u>4,800</u>	<u>7.5</u>

Potential for Expansion: A housing development on the left edge of the pond limits expansion of the present site. See Potential Site BL-6110, 6106 and 6112 which are located upstream.

Remarks: Route 20 forms the dam. The spillway through Route 20 is a concrete box culvert 15 feet wide and 15 feet deep. About 150 feet downstream from Route 20 is an old mill dam with vertical stone masonry faces upstream and downstream. The spillway is a concrete weir about 50 feet long and 2 feet deep. This spillway controls the pond level. Concrete in the Route 20 culvert is crumbled near the entrance. The old mill dam is in poor condition. Many trees are growing on the dam.

Ownership and Use: The pond is owned by the town of Auburn and is used for recreation.

Existing Site BL-6126 (Ramshorn Pond)

Location: On Ramshorn Brook at Dolan Road in Millbury, Mass. About one-half of the pond is in Sutton, Mass.

Worcester South, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Miles
<u>125</u>	<u>10</u>	<u>1,550</u>	<u>2.4</u>

Potential for Expansion: It appears that the present pond level could be raised 10 feet without affecting the many cottages that line the shore. Topography limits any significant increase in surface area. The relatively small drainage area limits expansion potential.

Remarks: Dolan Road forms the dam. The upstream slope is riprapped. The downstream side has a vertical stone face. The principal spillway inlet is submerged. There is a gate house at the downstream toe. The emergency spillway is constructed of granite blocks and is about 20 feet wide and 4 feet deep. Some seepage was observed near the downstream toe of the dam.

Existing Site BL-6126 (Ramshorn Pond) cont'd

Ownership The pond is owned by Massachusetts Electric Company and
and is used for water storage and recreation.
Use:

Existing Site BL-6127 (Eddy Pond)

Location: On Dark Brook about 800 feet upstream from Central Street
In Auburn, Mass.

Worcester South, Mass. USGS quadrangle

<u>Surface Area</u> <u>(Acres)</u>	<u>Height of</u> <u>Dam (Ft.)</u>	<u>Drainage Area</u> <u>(Acres)</u>	<u>Sq. Miles</u>
130	25	600	0.9

Potential The small drainage area limits expansion. Route 20 would
for be affected by any increase in pond level.
Expansion:

Remarks: The dam is an earthfill structure. The upstream slope is
riprapped. The spillway is a granite block weir about 25
feet long and 4 feet deep. There is also a gate - controlled
spillway with a submerged inlet.

Ownership The pond is owned by the town of Auburn and is used for
and recreation.
Use:

Existing Site BL-6129 (Dark Brook Reservoir)

Location: On Dark Brook about 100 feet upstream from Leicester Street in Auburn, Mass.

Worcester South, Mass. USGS quadrangle

<u>Surface Area</u> (Acres)	<u>Height of</u> <u>Dam (Ft.)</u>	<u>Drainage Area</u> (Acres)	<u>Sq. Miles</u>
285	20	1,400	2.2

Potential for Expansion: The reservoir is surrounded by streets, houses, railroads, and the Massachusetts Turnpike which limit expansion. The relatively small drainage area limits expansion.

Remarks: The dam is an earthfill structure. The upstream slope is riprapped. The principal spillway is a concrete ogee weir section about 15 feet long and 10 feet deep with a gate-controlled section about 3 feet wide and 3 feet deep for normal flow. There is also a gate-controlled 18" diameter conduit which discharges to a stone-lined channel. The dam and spillway system is in excellent condition.

Ownership and Use: The reservoir is owned by Massachusetts Electric Company and is used as a water storage reservoir.

Existing Site BL-6130 (Smiths Pond)

Location: On Kettle Brook about 1,400 feet upstream the Worcester - Leicester boundary in Leicester, Mass.

Worcester South, Mass. USGS quadrangle

<u>Surface Area</u> (Acres)	<u>Height of</u> <u>Dam (Ft.)</u>	<u>Drainage Area</u> (Acres)	<u>Sq. Miles</u>
20	12	6,200	9.7

Potential for Expansion: The pond is surrounded by streets and houses which limit expansion.

Remarks: Gerald Court forms the dam. The principal spillway inlet is a timber box about 6 feet wide and 4 feet deep.

Ownership and Use: The pond is owned by Leicester Realty and is used for water storage and recreation.

Existing Site BL-6131 (Lynde Brook Reservoir)

Location: On Lynde Brook about 200 feet upstream from Reservoir Street in Leicester, Mass.

Worcester North and Paxton, Mass. USGS quadrangles

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Miles
<u>125</u>	<u>50</u>	<u>1,650</u>	<u>2.6</u>

Potential for Expansion: The relatively small drainage area limits expansion potential.

Remarks: The dam is an earthfill structure with a long dike on the left abutment. The spillway is a granite block weir about 36 feet long and 4 feet deep which outlets to a rock-lined chute. The dam and spillway are in good condition.

Ownership and Use: The reservoir is owned by the city of Worcester and is used as a water supply.

Existing Site BL-6132 (Waite Pond)

Location: On Kettle Brook about 200 feet upstream from Chapel Street in Leicester, Mass.

Leicester and Paxton, Mass. USGS quadrangles

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Miles
<u>60</u>	<u>10</u>	<u>3,000</u>	<u>4.7</u>

Potential for Expansion: The pond is surrounded by streets and houses which limit expansion.

Remarks: The dam is a stone masonry structure with concrete side-walls. The spillway is a weir about 50 feet long and 4 feet deep. Concrete in the sidewalls is cracked.

Ownership and Use: The pond is owned by Worcester Knitting Company and is used for water storage and recreation.

Existing Site BL-6133 (Kettle Brook Reservoir #1)

Location: On Kettle Brook about 400 feet upstream from Mulberry Road in Leicester, Mass.

Paxton, Mass. USGS quadrangle

<u>Surface Area</u> (Acres)	<u>Height of</u> <u>Dam (Ft.)</u>	<u>Drainage Area</u> (Acres)	<u>Sq. Miles</u>
10	15	2,600	4.1

Potential for Expansion: It appears that the reservoir level could be raised about 25 feet without affecting any facilities. A much longer dam would be needed. Surface area would be nearly tripled.

Remarks: The dam is an earthfill structure. The spillway is a brick and concrete weir with granite block sidewalls which discharges to a paved chute which extends from the dam to Mulberry Road. The weir is about 50 feet wide and 5 feet deep. The dam and spillway is in good condition.

Ownership and Use: The reservoir is owned by the city of Worcester and is used as a water supply.

Existing Site BL-6134 (Kettle Brook Reservoir #2)

Location: On Kettle Brook about 3,200 feet upstream from Earle Street in Leicester, Mass.

Paxton, Mass. USGS quadrangle

<u>Surface Area</u> (Acres)	<u>Height of</u> <u>Dam (Ft.)</u>	<u>Drainage Area</u> (Acres)	<u>Sq. Miles</u>
25	25	1,900	3.0

Potential for Expansion: It appears that the reservoir level could be raised about 20 feet without affecting facilities other than streets. Surface area would be about doubled. Reservoir #3 (Site BL-6136) would be affected by any increase above 20 feet.

Remarks: The dam is an earthfill structure. The spillway is a granite block weir about 40 feet long and 5 feet deep which discharges to an ogee section paved with cobblestones. The dam and spillway are in good condition.

Ownership and Use: The reservoir is owned by the city of Worcester and is used as a water supply.

Existing Site BL-6135 (Southwick Pond)

Location: On an unnamed tributary to Lynde Brook about 900 feet upstream from Marshall Street in Leicester, Mass. One-quarter of the pond is in Paxton.

Paxton, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Miles
<u>40</u>	<u>10</u>	<u>500</u>	<u>0.8</u>

Potential for Expansion: The small drainage area limits expansion potential.

Remarks: The dam is an earthfill structure. The spillway is a 24" diameter pipe. Large trees are growing on the downstream slope of the dam.

Ownership and Use: The pond is owned by Tom Southwick and is used for recreation.

Existing Site BL-6136 (Kettle Brook Reservoir #3)

Location: On Kettle Brook about 600 feet downstream from the Paxton-Leicester town line in Leicester, Mass. Two-thirds of the reservoir is in Paxton.

Paxton, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Miles
<u>35</u>	<u>30</u>	<u>1,600</u>	<u>2.5</u>

Potential for Expansion: It appears that the reservoir level could be raised about 30 feet without affecting facilities other than Reservoir Drive. A much longer dam would be needed. Surface area would be nearly tripled. Reservoir #4 (Site BL-6137) would be affected by any increase above 30 feet.

Remarks: The dam is an earthfill structure. The spillway is a granite block and concrete weir about 36 feet long and 6 feet deep. The weir discharges to a lined chute. The dam and spillway are in good condition.

Ownership and Use: The reservoir is owned by the city of Worcester and is used as a water supply.

Existing Site BL-6137 (Kettle Brook Reservoir #4)

Location: On Kettle Brook about 5,100 feet upstream the Leicester - Paxton town line in Paxton, Mass.

Paxton, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Miles
<u>120</u>	<u>40</u>	<u>1,100</u>	<u>1.7</u>

Potential for Expansion: The relatively small drainage area limits expansion potential.

Remarks: The dam is an earthfill structure. The spillway is a granite block weir about 30 feet long and 4 feet deep which discharges to a rock-lined chute. The dam and spillway are in good condition.

Ownership and Use: The reservoir is owned by the city of Worcester and is used as a water supply.



BL-6114
Holden Reservoir #1



BL-6117
Patch Reservoir



BL-6115
Holden Reservoir #2



BL-6119
Coes Reservoir



BL-6116
Cook Pond

EXISTING RESERVOIRS
SUBWATERSHED BL-61
RAMSHORN BROOK





BL-6120
Coes Pond



BL-6123
Stoneville Pond



BL-6121
Curtis Pond



BL-6124
Stoneville Reservoir



BL-6122
Leesville Pond

EXISTING RESERVOIRS
SUBWATERSHED BL-61
RAMSHORN BROOK





BL-6125
Pondville Pond



BL-6129
Dark Brook Reservoir



BL-6126
Ramshorn Pond



BL-6131
Lynde Brook Reservoir



BL-6127
Eddy Pond

EXISTING RESERVOIRS
SUBWATERSHED BL-61
RAMSHORN BROOK





BL-6132
Waite Pond



BL-6136
Kettle Brook Reservoir #3



BL-6133
Kettle Brook Reservoir #1



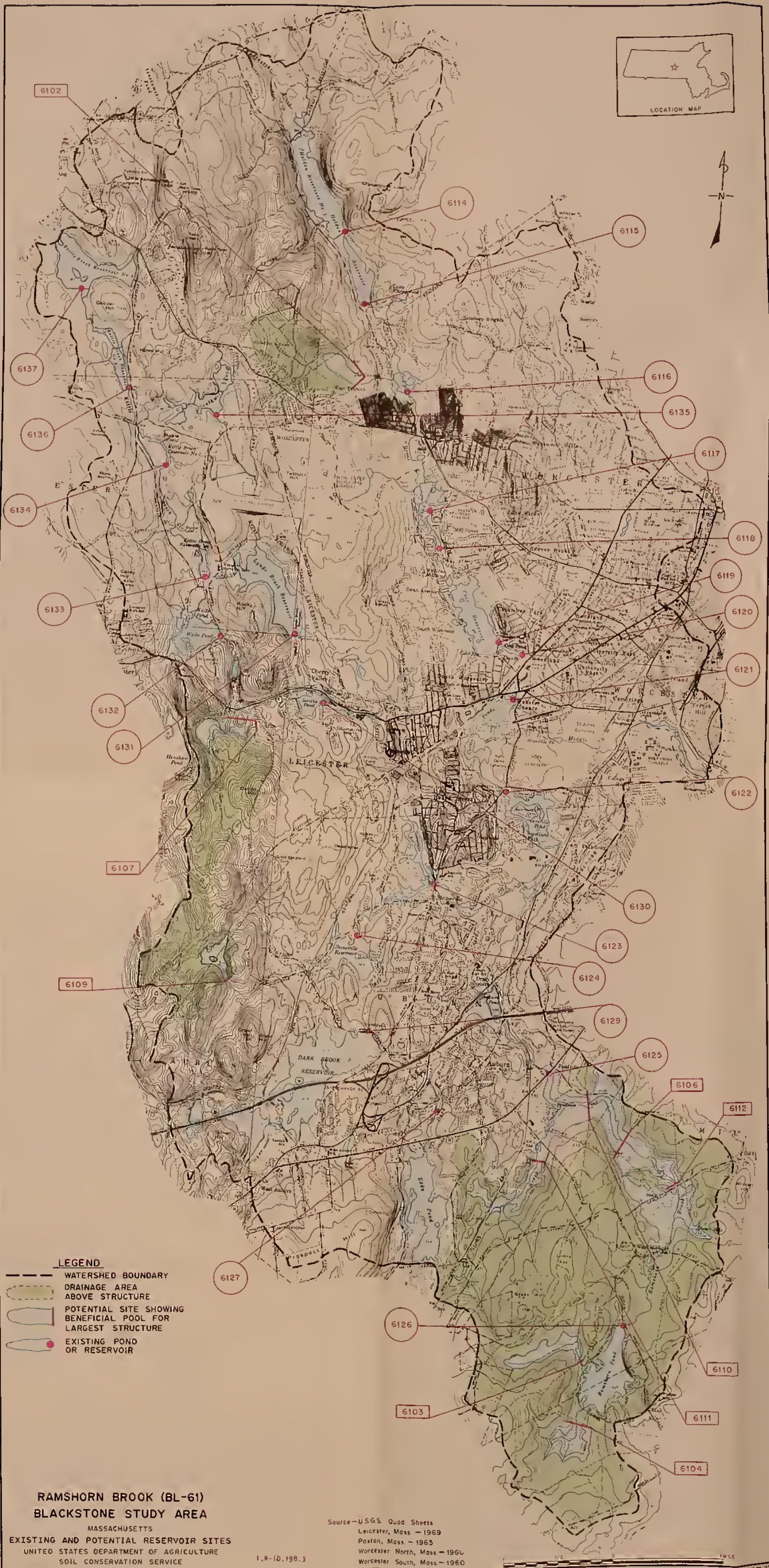
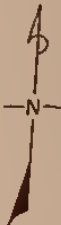
BL-6137
Kettle Brook Reservoir #4



BL-6135
Southwick Pond

EXISTING RESERVOIRS
SUBWATERSHED BL-61
RAMSHORN BROOK





LEGEND

- WATERSHED BOUNDARY
- DRAINAGE AREA ABOVE STRUCTURE
- POTENTIAL SITE SHOWING BENEFICIAL POOL FOR LARGEST STRUCTURE
- EXISTING POND OR RESERVOIR

**RAMSHORN BROOK (BL-61)
BLACKSTONE STUDY AREA**

MASSACHUSETTS
EXISTING AND POTENTIAL RESERVOIR SITES
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Source—USGS Quad Sheets
Leicester, Mass. — 1969
Paxton, Mass. — 1965
Worcester North, Mass. — 1960
Worcester South, Mass. — 1960

1,8-10, 198.3

1:25,000

BLACKSTONE STUDY AREA
SITE DATA FOR

Subwatershed BL-62, Blackstone River

The Blackstone River subwatershed covers about 28,500 acres in Auburn, Grafton, Holden, Millbury, Oxford, Sutton, West Boylston, and Worcester; all in Worcester County.

The subwatershed includes those areas draining to the Blackstone River from the Middle River near Greenwood Street in Worcester downstream to the confluence with the Quinsigamond River in Grafton, Mass. A major portion of the city of Worcester is located in the subwatershed.

Geology of the potential reservoir sites is characterized by 15 to 30 feet of glacial till, outwash sand and gravel, or englacial drift underlain by granitic gneiss or schist bedrock.

Eight potential reservoir sites and 20 existing reservoirs were studied.

POTENTIAL SITE BL-6202

Location: On an unnamed tributary to Indian Lake about 500 feet upstream of Holden Street in Worcester, Mass.

Worcester, North, Mass. USGS quadrangle

Latitude: 42°18'32"

Longitude: 71°49'15"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	House	650
	Garage	650
	2 Sheds	610

Geologic Conditions: The left abutment is outwash sand and gravel. The right abutment is dense, glacial till. Depth to bedrock in the foundation is estimated to be from 15 to 25 feet. Waterholding capabilities appear to be poor. Leakage is expected through the left abutment and the foundation. Borrow material for dam construction was located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6204

Location: On an unnamed tributary to the Blackstone River about 1,200 feet upstream from Route 20 in Auburn, Mass.

Worcester, South, Mass. USGS quadrangle

Latitude: 42°12'50"

Longitude: 71°48'24"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	Route 20	470
	Mobile Home	465
	20 Mobile Homes	460
	House	460
	10 Mobile Homes	455
	10 Mobile Homes	450
	10 Mobile Homes	445

Geologic Conditions: The left abutment is outwash sand and gravel. The right abutment is outwash sand and gravel near the toe of the slope with dense glacial till high on the slope. Depth to schist bedrock in the foundation is estimated to be from 10 to 15 feet. Waterholding capabilities appear to be poor unless a positive cutoff can be made to bedrock or glacial till. Previous borrow material for dam construction was located near the site; impervious material was not located.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6206

Location: On an unnamed tributary to the Blackstone River about 300 feet upstream from Grafton Street in Millbury, Mass. One abutment of the dam is in Grafton, Mass.

Grafton, Mass. USGS quadrangle

Latitude: 42°11'51"

Longitude: 71°43'34"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	Telephone Cable	360

Geologic Conditions: The left abutment is dense glacial till. The right abutment is thin discontinuous englacial drift with outcrops of granitic gneiss. Granitic gneiss bedrock outcrops in the foundation. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6207

Location: On an unnamed tributary to the Blackstone River about 1,100 feet upstream from Fitzpatrick Road in Grafton, Mass.

Grafton, Mass. USGS quadrangle

Latitude: 42°11'35"

Longitude: 71°43'03"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	3 Houses	350
	2 Houses	340
	Millbury Street	340
	House	335
	Fitzpatrick Road	330

Geologic Conditions: Both abutments are poorly graded sand and silty sand near the toe of the slopes with dense glacial till high on the slopes. Depth to bedrock in the foundation is estimated to be from 15 to 25 feet. Waterholding capabilities appear to be fair to good. Borrow material for dam construction was located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6208

Location: On an unnamed tributary to the Blackstone River about 500 feet upstream of Follett Street in Grafton, Mass.

Grafton, Mass. USGS quadrangle

Latitude: 42°11'09"

Longitude: 71°42'50"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	Building Foundation	340
	Millbury Street	340
	Barn	335
	House	325
	Fitzpatrick Road	325
	Power Line	325

Geologic Conditions: The left abutment is outwash sand and gravel. The right abutment is dense glacial till. Depth to granite bedrock in the foundation is estimated to be from 15 to 20 feet. Waterholding capabilities appear to be poor. Leakage is expected through the left abutment and the foundation. Borrow material for dam construction was located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6209

Location: On Cold Spring Brook about 1,250 feet downstream from the Worcester-Providence Turnpike (Route 146) in Sutton, Mass.

Grafton, Mass. USGS quadrangle

Latitude: $42^{\circ}09'40''$ Longitude: $71^{\circ}43'59''$

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	4 Houses	405
	Motel	405
	Restaurant	405
	Auction House	405

Geologic Conditions: Both abutments are outwash sand and gravel. Depth to granite bedrock in the foundation is estimated to be from 40 to 50 feet. Waterholding capabilities appear to be poor. Leakage is expected through both abutments and the foundation. Pervious borrow material for dam construction was located near the site; impervious material was not located.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location. The left abutment is being excavated for sand and gravel.

POTENTIAL SITE BL-6212

Location: On Casey Brook about 250 feet upstream of Uxbridge Road in Sutton, Mass.

Worcester, South, Mass. USGS quadrangle

Latitude: $42^{\circ}08'39''$ Longitude: $71^{\circ}45'12''$

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	House	580
	House	575
	House	560
	House	555
	Barn	550
	2 Houses	545
	Gas Line	530
	Private Road	530

Geologic Conditions: Both abutments are dense glacial till. Depth to schist bedrock in the foundation is estimated to be from 15 to 20 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was not located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6213

Location: On Casey Brook about 800 feet upstream of Putnam Hill Road in Sutton, Mass.

Worcester, South, Mass. USGS quadrangle

Latitude: 42°08'28"

Longitude: 71°46'18"

Facilities Affected: None below elevation 630.

Geologic Conditions: The left abutment is dense glacial till. The right abutment is discontinuous englacial drift. Both abutments are probably shallow to bedrock. Depth to biotite hornblende gneiss bedrock in the foundation is estimated to be from 10 to 15 feet. Waterholding capabilities appear to be fair to poor. Leakage is expected through the right abutment. Borrow material for dam construction was located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

SUMMARY DATA FOR POTENTIAL UPSTREAM RESERVOIR SITES

STUDY AREA-BLACKSTONE RIVER															SUBWATERSHED BLACKSTONE RIVER																																																																										
BENEFICIAL POOL															EMERGENCY SPILLWAY															DESIGN															DAM															SAFE															YIELD														

** DO NOT USE FOR FINAL SITE SELECTION OR LAND ACQUISITION. **

NOTES - (1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.

(2) EMERGENCY SPILLWAY STORAGE AND COSTS ARE BASED ON TOTAL STORAGE, INCLUDING BENEFICIAL POOL.

(3) EMERGENCY SPILLWAY TYPE CODE- C=CONCRETE CHUTE, D=CONCRETE DROP, E=EXCAVATED, T= TWO SPILLWAYS, N= NONE

(4) TABULAR DATA ARE BASED ON PRELIMINARY INFORMATION. FIGURES SHOWN ARE PRIMARILY FOR COMPARISON PURPOSES.

(5) ELEVATIONS ARE SHOWN TO THE NEAREST 0.1 FOOT TO SHOW VARIATION BETWEEN DEVELOPMENTS ONLY, AND ARE NOT TO BE CONSIDERED ACCURATE TO THAT DEGREE.

STUDY AREA--BLACKSTONE RIVER															SUBWATERSHED BLACKSTONE RIVER																																												
BENEFICIAL POOL															EMERGENCY SPILLWAY															DESIGN															DAM														
ELEV	STORAGE	COST PER AC FT	AREA (AC)	COST/ SURF AC	DEPTH AT DAM	CREST ELEV	STORAGE AT CREST	COST PER AC FT	TOP ELEV	ELEV AREA	HGT VOL (1000 CY)	FILL VOL	PERCENT CHANCE	SAFE YIELD																																													
(MSL)	AC FT IN	(\$)	(AC)	(\$)	(FT)	MSL	AC FT IN	(\$)	(MSL)	(AC)	(MSL)	FT CY	MGD																																														
DA= 2.10 SQ MI = 1344 AC															USGS QUAD-- GRAFTON															LATITUDE 42-11-35 LONGITUDE 71-43-03																													
STREAM WATER QUALITY (B)															100-YR PRIN SPWY DESIGN STORM															RUNOFF = 7.30 IN, PEAK FLOW = 877 CFS																													
SITE-BL-6207																																																											
SITE RATING (2)																																																											
322.2	0	0.0	12	18690	2.2	333.1	E	465	4.1	1230	335.5	84	18	17																																													
326.5	100	0.8	35	18690	6.5	333.0	E	461	4.1	1430	335.5	84	18	17																																													
331.9	367	3.3	64	13560	11.8	336.4	E	730	6.5	1200	338.7	102	22	25																																													
338.4	901	8.0	100	11540	18.4	340.9	E	1187	10.6	970	343.2	132	26	40																																													
342.5	1363	12.2	126	11930	22.5	345.0	E	1719	15.2	880	347.4	161	30	71																																													
*****															*****															*****																													
DA= 2.50 SQ MI = 1600 AC															USGS QUAD-- GRAFTON															LATITUDE 42-11-09 LONGITUDE 71-42-50																													
STREAM WATER QUALITY (B)															100-YR PRIN SPWY DESIGN STORM															RUNOFF = 7.30 IN, PEAK FLOW = 1044 CFS																													
SITE-BL-6208																																																											
SITE RATING (3)																																																											
306.5	0	0.0	13	38120	2.5	318.9	E	553	4.1	1890	321.2	87	20	60																																													
310.6	100	0.8	35	38120	6.6	321.1	E	736	5.5	1810	323.6	107	23	75																																													
318.9	536	4.0	71	24870	14.8	325.4	E	1173	8.8	1500	327.9	145	27	110																																													
327.2	1407	10.6	140	15080	23.2	329.7	E	1802	13.5	1170	332.2	179	31	153																																													
332.5	2240	16.7	181	13410	28.5	335.0	E	2735	20.5	890	337.2	214	36	221																																													
*****															*****															*****																													
DA= 4.30 SQ MI = 2752 AC															USGS QUAD-- GRAFTON															LATITUDE 42-09-40 LONGITUDE 71-43-59																													
STREAM WATER QUALITY (B)															100-YR PRIN SPWY DESIGN STORM															RUNOFF = 7.30 IN, PEAK FLOW = 1162 CFS																													
SITE-BL-6209																																																											
SITE RATING (3)																																																											
396.2	100	0.4	23	28660	12.3	396.2	T	134	0.6	4860	407.2	49	26	15																																													
398.2	147	0.6	27	26180	14.2	398.2	T	182	0.8	3840	407.1	49	26	14																																													
399.9	194	0.8	30	23200	15.8	399.9	T	229	1.0	3050	407.9	51	27	17																																													
402.5	283	1.2	37	19600	18.5	402.5	T	317	1.4	2270	408.0	51	27	17																																													
*****															*****															*****																													

(1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.

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(5) ELEVATIONS ARE SHOWN TO THE NEAREST 0.1 FOOT TO SHOW VARIATION BETWEEN DEVELOPMENTS ONLY, AND ARE NOT TO BE CONSIDERED ACCURATE TO THAT DEGREE.

*** DO NOT USE FOR FINAL SITE SELECTION OR LAND ACQUISITION. ***

Existing Site BL-6214 (Indian Lake)

Location: On a tributary to Weasel Brook about 700 feet upstream from Stores Street in Worcester, Mass.

Worcester North, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Miles
<u>210</u>	<u>15</u>	<u>1,950</u>	<u>3.0</u>

Potential for Expansion: Streets and houses surrounding the lake limit expansion. About 40 houses on Sears Island would also be affected.

Remarks: The dam is an earthfill structure. The upstream face of the dam is a vertical concrete wall. The spillway is a granite block structure with two bays each 6 feet wide and 5 feet deep which discharge to a stepped chute. The chute discharges to an underground conduit. Seepage was visible at the downstream toe of the dam. Concrete in the vertical upstream wall is cracked and crumbled in places. Trees are growing on the downstream slope of the dam.

Ownership and Use: The lake is owned by the city of Worcester and is used for recreation.

Existing Site BL-6215 (Green Hill Pond)

Location: In Green Hill Park in Worcester, Mass.

Worcester North, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>25</u>	<u>15</u>	<u>150</u>	<u>0.2</u>

Potential for Expansion: The small drainage area limits expansion potential.

Remarks: A roadway through Green Hill Park forms the dam. The spillway inlet is submerged. The outlet is a 36-inch diameter concrete pipe. The dam and spillway are in good condition.

Ownership and Use: The pond is owned by the city of Worcester and is used for recreation.

Existing Site BL-6216 (Salisbury Pond)

Location: On Weasel Brook about 1,500 feet downstream from Route 122A in Worcester, Mass.

Worcester North, Mass. USGS quadrangle

<u>Surface Area</u> <u>(Acres)</u>	<u>Height of</u> <u>Dam (Ft.)</u>	<u>Drainage Area</u> <u>(Acres)</u>	<u>Sq. Miles</u>
15	15	2,900	4.5

Potential for Expansion: Surrounding streets and development limit expansion.

Remarks: Route 122A forms the dam. The spillway is a semi-circular weir about 60 feet long. There is a timber gate control at the left end of the weir. The gate is about 4 feet wide and 8 feet deep. Three 8-foot diameter culverts carry flow beneath Route 122A. The dam and spillway is in good condition.

Ownership and Use: The pond is owned by the city of Worcester and is used for recreation.

Existing Site BL-6217 (Dorothy Pond)

Location: On Dorothy Brook near Riverlin Street in Millbury, Mass.

Grafton, Mass. USGS quadrangle

<u>Surface Area</u> <u>(Acres)</u>	<u>Height of</u> <u>Dam (Ft.)</u>	<u>Drainage Area</u> <u>(Acres)</u>	<u>Sq. Miles</u>
145	12	2,650	4.1

Potential for Expansion: The pond is surrounded by streets, houses, a railroad and the Massachusetts Turnpike which limit expansion.

Remarks: The dam is an earthfill structure with steep side slopes. The principal spillway is a placed stone gate-controlled opening about 3 feet wide and 5 feet deep. The emergency spillway is an excavated spillway about 25 feet wide and 3 feet deep. Side slopes of the dam are eroded. Stone masonry in the principal spillway is in poor condition. Stone riprap has fallen into the emergency spillway.

Ownership and Use: The pond is owned by Buck Mill Company and is used for recreation.

Existing Site BL-6218 (Howes Reservoir)

Location: On an unnamed tributary to the Blackstone River about 1,200 feet upstream from Howe Avenue in Millbury, Mass.

Worcester South, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Miles
<u>15</u>	<u>6</u>	<u>300</u>	<u>0.5</u>

Potential for Expansion: The small drainage area limits expansion potential.

Remarks: The dam is a gravel-fill structure. There is also a narrow earthfill dike. The spillway is an 18-inch diameter cast iron pipe. The dike is covered with trees and leakage is visible.

Ownership and Use: The reservoir is owned by Mass. Water Works Company and is used for water storage.

Existing Site BL-6219 (Howe Pond)

Location: On an unnamed tributary to the Blackstone River between Hower Avenue and the Penn Central Railroad in Millbury, Mass.

Worcester South, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Miles
<u>5</u>	<u>6</u>	<u>400</u>	<u>0.6</u>

Potential for Expansion: Roads and houses upstream limit expansion. Topography limits any significant increase in surface area.

Remarks: The dam is an earthfill structure. The spillway is a concrete weir about 6 feet long and 2 feet deep. Water passes over an earthfill section of the dam creating an erosion problem. Trees are growing on the dam.

Ownership and Use: The pond is owned by Massachusetts Water Works Company and is used for water storage.

Existing Site BL-6220

Location: On Dorthy Brook about 600 feet upstream from Grafton Street in Millbury, Mass.

Grafton and Worcester South, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	(Sq. Mi.)
<u>10</u>	<u>10</u>	<u>3,500</u>	<u>5.5</u>

Potential for Expansion: The pond is surrounded by streets, houses, and a factory which limit expansion.

Remarks: The dam is an earthfill structure. The spillway is a stone and concrete weir about 15 feet long and 3 feet deep. There is a small industrial plant adjacent to the spillway.

Ownership and Use: The pond is owned by W. W. Windle and Constance Dobie and is used for industrial power.

Existing Site BL-6221(Mayo Pond)

Location: On Singletary Brook about 200 feet upstream from Burbank Road in Millbury, Mass.

Worcester South, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	(Sq. Mi.)
<u>10</u>	<u>20</u>	<u>3,000</u>	<u>4.7</u>

Potential for Expansion: Topography limits any significant increase in surface area. Several streets and factory buildings would be affected by expansion.

Remarks: The dam is an earthfill structure with a mill building on the left abutment. The spillway is a concrete weir about 25 feet long and 4 feet deep which discharges flow through the mill. A gate-controlled spillway on the left abutment services another portion of the mill. Some concrete in the spillway sidewalls is crumbling.

Ownership and Use: The pond is owned by Delco Rubber Company and is used for industrial water storage.

Existing Site BL-6222(Brierly Pond)

Location: On Singletary Brook about 200 feet upstream from West Main St. in Millbury, Mass.

Worcester South, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	(Sq. Mi.)
<u>15</u>	<u>10</u>	<u>2,600</u>	<u>4.1</u>

Potential for Expansion: Several streets and houses would be affected by construction of a much longer dam needed to raise the pond level. Topography limits any significant increase in surface area.

Remarks: The dam is an earthfill structure. The principal spillway is a flashboard structure with gated opening. The spillway is 4 feet by 4 feet and discharges flow to a rock-lined channel. Large trees are growing on the dam. Structural concrete has some cracks.

Ownership and Use: The pond is owned by W. W. Windle Corporation and is used as a storage reservoir.

Existing Site BL-6223(Singletary Pond)

Location: On Singletary Brook about 400 feet upstream from Harris Road in Millbury, Mass.

Worcester South, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	(Sq. Mi.)
<u>330</u>	<u>15</u>	<u>2,300</u>	<u>3.6</u>

Potential for Expansion: About 100 cottages would be affected by an increase in pond level. The relatively small drainage area limits expansion potential.

Remarks: The dam is an earthfill structure with rock riprap on the upstream slope. Flow passes through a gate house to an underground conduit for about 150 feet to a secondary control structure and a rock-lined channel. Some seepage was observed over the underground conduit.

Ownership and Use: The pond is owned by W. W. Windle Company and Singletary Corporation and is used for water storage and recreation.

Existing Site BL-6224(Welsh Pond)

Location: On Singletary Brook just upstream from Sutton Road in Millbury, Mass.

Worcester South, Mass. USGS quadrangle

<u>Surface Area</u> (Acres)	<u>Height of</u> <u>Dam(Ft.)</u>	<u>Drainage Area</u> (Acres)	<u>(Sq. Mi.)</u>
10	10	1,650	2.6

Potential for Expansion: Raising the pond level by 20 feet would affect Sutton Road and a pipeline. Surface area would be about doubled. Any further expansion would affect Stockwell Ponds located upstream.

Remarks: The dam is an earthfill structure. The upstream slope is placed stone. The spillway is a concrete box conduit with flashboard inlet. Trees are growing on the dam. Seepage areas are visible on the downstream slope.

Ownership and Use: The pond is owned by the Mass. Division of Fisheries and Wildlife and is used for recreation.

Existing Site BL-6225(Stockwell Pond)

Location: On Singletary Brook at West Millbury Road in Sutton, Mass.

Worcester South, Mass. USGS quadrangle

<u>Surface Area</u> (Acres)	<u>Height of</u> <u>Dam(Ft.)</u>	<u>Drainage Area</u> (Acres)	<u>(Sq. Mi.)</u>
5	6	1,200	1.9

Potential for Expansion: Raising the pond level by 40 feet would affect West Sutton Road. Surface area would be about 100 acres. Stockwell Ponds(BL-6226 & 6227) located upstream would be affected.

Remarks: West Millbury Road forms the dam. Upstream and downstream faces are placed stone. The spillway inlet is a concrete structure with flashboards. Spillway opening is about 3 feet wide and 5 feet deep. Trees are growing on the dam. Concrete has crumbled and cracked in the spillway inlet.

Ownership and Use: The site is owned by the Mass. Division of Fisheries and Wildlife and is used for recreation.

Existing Site BL-6226 (Stockwell Pond)

Location: On Singletary Brook about 900 feet upstream from West Millbury Road in Sutton, Mass.

Worcester South, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>20</u>	<u>6</u>	<u>1,000</u>	<u>1.6</u>

Potential for Expansion: Raising the pond level by 40 feet would affect West Sutton Road. Any expansion would affect sites BL-6225 and 6227.

Remarks: The dam is an earthfill structure with vertical placed stone walls supporting the fill. The spillway is a 2-bay concrete flashboard structure. Each bay is about 4 feet wide and 5 feet deep. There is a small concrete emergency spillway on the left abutment. Trees are growing on the dam. Concrete in the spillway has crumbled and broken in many places. There is some erosion near the spillway.

Ownership and Use: The pond is owned by the Mass. Division of Fisheries and Wildlife.

Existing Site BL-6227 (Stockwell Pond)

Location: On Singletary Brook about 3100 feet upstream from West Millbury Road in Sutton, Mass.

Worcester South, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>15</u>	<u>10</u>	<u>850</u>	<u>1.3</u>

Potential for Expansion: Raising the pond level by 40 feet would affect West Sutton Road. Surface area would be nearly doubled.

Remarks: The dam is an earthfill structure with vertical placed stone walls on both slopes. The spillway is a 2-bay concrete flashboard structure. Each bay is about 4 feet wide and 8 feet deep. The spillway conduit is a concrete box about 5 feet wide by 5 feet deep. Trees are growing on the dam. Stonework on the upstream face of the dam has broken away in places. Seepage is visible at the downstream toe of the dam.

Ownership and Use: The pond is owned by the Mass. Division of Fisheries and Wildlife and is used for recreation.

Existing Site BL-6228(Cogan Pond)

Location: On Cold Spring Brook about 1800 feet upstream from Armsby Road in Sutton, Mass.

Grafton, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>5</u>	<u>30</u>	<u>1,950</u>	<u>3.0</u>

Potential for Expansion: Limited. Clark Reservoir is located immediately upstream.

Remarks: The dam is an earthfill structure with vertical granite block retaining walls upstream and downstream. The principal spillway is a placed stone opening 6 feet wide by 3 feet high. There is also a 30-foot long and 6-foot deep concrete weir on the right abutment. A large hole on the top of the dam appears to be due to piping of material through the dam. The dam has been breached by order of the County Commissioners.

Ownership and Use: The site is owned by Borje Jalar and is no longer used.

Existing Site BL-6229(Clark Reservoir)

Location: On Cold Spring Brook about 2900 feet upstream from Armsby Road in Sutton, Mass.

Grafton, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>35</u>	<u>15</u>	<u>1,900</u>	<u>3.0</u>

Potential for Expansion: Raising the reservoir level by 20 feet would affect Boston Road, Uxbridge Road and a pipeline. Surface area would be more than doubled.

Remarks: The dam is an earthfill structure which has been breached. Water flows through a breach in the center of the dam. A pool remains below the level of the breach.

Ownership and Use: The site is owned by Ray Dodge and the Millbury Savings Bank. The site is no longer used for a specific purpose.

Existing Site BL-6230(Sibley Reservoir)

Location: On an unamed tributary to Cold Spring Brook about 300 feet upstream from Burbank Road in Sutton, Mass.

Worcester South, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>30</u>	<u>25</u>	<u>350</u>	<u>0.5</u>

Potential for Expansion: The small drainage area limits the expansion potential.

Remarks: The dam is an earthfill structure with riprap on the upstream slope. The principal spillway is an 18-inch-diameter corrugated metal pipe. The dam has been breached by order of the County Commissioners.

Ownership and Use: The site is owned by the Alex Skowronski estate and is no longer used for a specific purpose.

Existing Site BL-6231(Marble Pond)

Location: On an unnamed tributary to Cold Spring Brook at Marble Road in Sutton, Mass.

Grafton, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>10</u>	<u>10</u>	<u>700</u>	<u>1.1</u>

Potential for Expansion: Topography limits any significant increase in surface area. A much longer dam would be required for any increase in pond level.

Remarks: Marble Road forms the dam. The spillway is a placed stone weir about 8 feet long and 4 feet deep which discharges flow through Marble Road in a stone culvert about 4 feet wide and 6 feet deep. Trees and brush are growing on both slopes of the dam.

Ownership and Use: The pond is owned by Charles Tebo and is used for water storage.

Existing Site BL-6233(Woodbury Pond)

Location: On Cold Spring Brook at Boston Road in Sutton, Mass.

Grafton, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>10</u>	<u>20</u>	<u>3,300</u>	<u>5.2</u>

Potential for Expansion: Raising the pond level by 15 feet would affect Boston Road, the Worcester-Providence Turnpike and several buildings. Surface area would be nearly quadrupled.

Remarks: Boston Road forms the dam. The spillway is a battery of six five-foot diameter corrugated metal pipes with a single concrete headwall. Flow discharges onto granite block steps. The dam and spillway are in good condition.

Ownership and Use: The pond is owned by Richard DeCaetano Bros, Inc. and is an old mill pond which is no longer used.

Existing Site BL-6234(Merrill Pond)

Location: On Singletary Brook at Hutchinson Road in Sutton, Mass.

Worcester South, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>30</u>	<u>15</u>	<u>1,400</u>	<u>2.2</u>

Potential for Expansion: Raising the pond level by 20 feet would affect West Sutton, Millbury, and Eight Lots Roads and 4 houses. Surface area would be more than quadrupled. Stockwell Ponds, located upstream would be affected.

Remarks: Hutchinson Road forms the dam. The principal spillway is a concrete flume with flashboard control. The spillway is 4-feet wide and 5-feet deep. There is also a flashboard-controlled spillway which controls flow to a fish rearing pond. Small trees and brush are growing on the dam. There is some erosion near the principal spillway.

Ownership and Use: The pond is owned by the Mass. Division of Fisheries and Wildlife and is used for recreation.



BL-6216
Salisbury Pond



BL-6220



BL-6217
Dorothy Pond



BL-6219
Howes Reservoir



BL-6221
Mayo Pond





BL-6222
Brierly Pond



BL-6225
Stockwell Pond



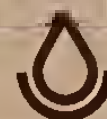
BL-6223
Singletary Pond



BL-6224
Welsh Pond



BL-6226
Stockwell Pond





BL-6227
Stockwell Pond



BL-6233
Woodbury Pond



BL-6228
Cogan Pond



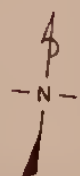
BL-6234
Merrill Pond



BL-6231
Marble Pond

EXISTING RESERVOIRS
SUBWATERSHED BL-62
BLACKSTONE RIVER

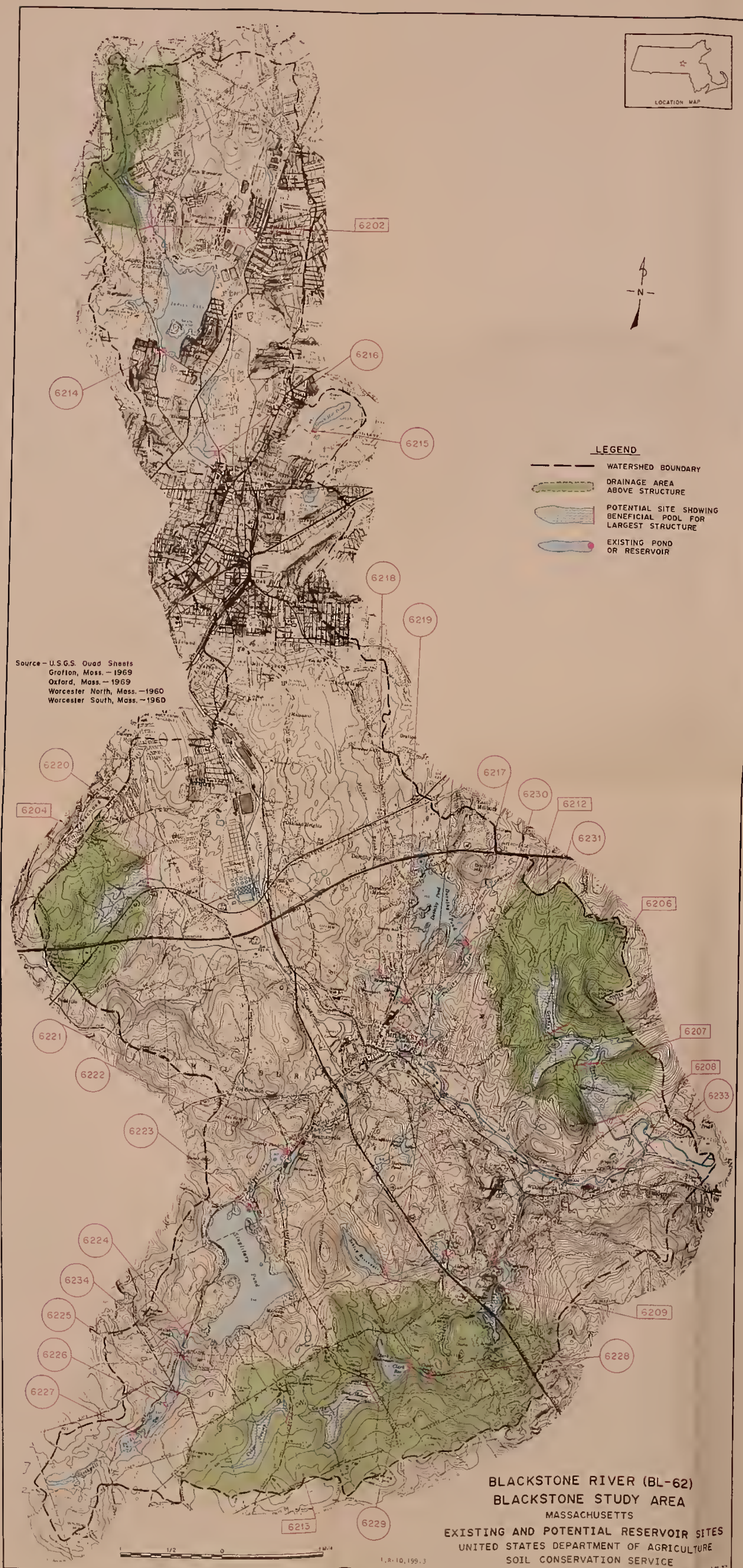




LEGEND

- WATERSHED BOUNDARY
- DRAINAGE AREA ABOVE STRUCTURE
- POTENTIAL SITE SHOWING BENEFICIAL POOL FOR LARGEST STRUCTURE
- EXISTING POND OR RESERVOIR

Source—U.S.G.S. Quad Sheets
Grafton, Mass.—1969
Oxford, Mass.—1969
Worcester North, Mass.—1960
Worcester South, Mass.—1960



BLACKSTONE RIVER (BL-62)
BLACKSTONE STUDY AREA
MASSACHUSETTS
EXISTING AND POTENTIAL RESERVOIR SITES
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

BLACKSTONE STUDY AREA
SITE DATA FOR

Subwatershed BL-63, Quinsigamond River

The Quinsigamond River subwatershed covers about 25,100 acres in Boylston, Grafton, Millbury, Shrewsbury, West Boylston, and Worcester; all in Worcester County.

The subwatershed includes the drainage area of the Quinsigamond River from its origin north of Lake Quinsigamond to the confluence with the Blackstone River in Grafton.

Geology of the potential reservoir sites is characterized by 5 to 20 feet of glacial till or outwash sand and gravel underlain by schist bedrock.

Seven potential reservoir sites and 9 existing reservoirs were studied.

POTENTIAL SITE BL-6301

Location: On Sewall Brook about 100 feet upstream of Temple Street in Boylston, Mass.

Shrewsbury, Mass. USGS quadrangle

Latitude: 42°20'06"

Longitude: 71°43'34"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	House	550

Geologic Conditions: Both abutments are grey schist bedrock overlain in places by thin discontinuous englacial drift. Schist bedrock outcrops in the foundation. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6302

Location: On Sewall Brook about 600 feet upstream of Sewall Street in
Boylston, Mass.

Shrewsbury, Mass. USGS quadrangle

Latitude: 49°19'30" Longitude: 71°44'22"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	House	460
	Sewall Street	450
	Gas Line	445

Geologic Conditions: Both abutments are outwash sand and gravel. Schist bedrock outcrops in the foundation. Waterholding capabilities appear to be poor. Leakage is expected through both abutments and through the foundation. Pervious borrow material for dam construction was located near the site; impervious material was not located.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location. The left abutment is being excavated for sand and gravel.

POTENTIAL SITE BL-6303

Location: On an unnamed tributary to Poor Farm Brook at the roadway between
Mountain Street and Shrewsbury Street in Worcester, Mass.

Worcester, North, Mass. USGS quadrangle

Latitude: 42°19'17" Longitude: 71°47'02"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	4 Houses	595
	Burncoat Street	595
	House	590
	House	580
	2 Sheds	575
	Shed	570
	2 Houses	565
	Shed	565
	House	560
	Power Line	560

Geologic Conditions: Both abutments are dense glacial till. Depth to schist bedrock in the foundation is estimated to be from 15 to 25 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6306

Location: On West Brook about 2,300 feet upstream of Main Street in Shrewsbury, Mass.

Shrewsbury, Mass. USGS quadrangle

Latitude: 42°17'43" Longitude: 71°44'04"

Facilities Affected: None below elevation 450.

Geologic Conditions: The left abutment is outwash sand and gravel. The right abutment is schist bedrock overlain by thin discontinuous englacial drift. Depth to schist bedrock in the foundation is estimated to be from 10 to 20 feet. Waterholding capabilities appear to be fair to poor. Leakage is expected through the left abutment and the foundation. Pervious borrow material for dam construction was located near the site; impervious material was not located.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6310

Location: On an unnamed tributary to Big Bummet Brook about 700 feet upstream from the Grafton-Shrewsbury town line in Shrewsbury, Mass.

Shrewsbury, Mass. USGS quadrangle

Latitude: 42°15'02" Longitude: 71°42'02"

Facilities Affected: None below elevation 430.

Geologic Conditions: The left abutment is dense glacial till with grey schist bedrock outcrops. The right abutment is outwash sand and gravel with schist bedrock outcrops high on the slope. Depth to schist bedrock in the foundation is estimated to be from 20 to 30 feet. Waterholding capabilities appear to be fair to good. Leakage is expected through the right abutment.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6311

Location: On an unnamed tributary to Big Bummer Brook about 200 feet upstream from the Boston and Albany Railroad in Grafton, Mass.

Grafton, Mass. USGS quadrangle

Latitude: 42°14'36"

Longitude: 71°42'18"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	3 Sheds	370
	2 Sheds	365
	3 Houses	360

Geologic Conditions: The left abutment is outwash sand and gravel. The right abutment is thin discontinuous englacial drift underlain by granite bedrock. Depth to granite bedrock in the foundation is estimated to be from 15 to 25 feet. Waterholding capabilities appear to be poor. Leakage is expected through the left abutment and the foundation. Previous borrow material for dam construction was located near the site; impervious material was not located.

Engineering Notes: Neither abutment is recommended for the excavated emergency spillway location. A concrete emergency spillway may be needed at this site.

POTENTIAL SITE BL-6312

Location: On Axtell Brook about 150 feet upstream of the Massachusetts Turnpike in Grafton, Mass.

Grafton, Mass. USGS quadrangle

Latitude: 42°13'40"

Longitude: 71°41'05"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	2 Houses	380

Geologic Conditions: The left abutment is thin discontinuous englacial drift underlain by schist bedrock. The right abutment is outwash sand and gravel. Depth to schist bedrock in the foundation is estimated to be from 10 to 20 feet. Waterholding capabilities appear to be fair to good. Leakage is expected through the right abutment and the foundation. Previous borrow material for dam construction was located near the site; impervious material was not located.

Engineering Notes: Neither abutment is recommended for the excavated emergency spillway location. A concrete emergency spillway may be needed at this site.

SUMMARY DATA FOR POTENTIAL UPSTREAM RESERVOIR SITES

53

STUDY AREA-BLACKSTONE RIVER										SUBWATERSHED QUINSIGAMOND RIVER									
BENEFICIAL POOL																			
ELEV	STORAGE	AC FT	PER (\$)	AREA (AC)	COST/ SURF (\$)	DEPTH AT DAM (FT)	CREST ELEV (MSL)	STORAGE AT CREST	EMERGENCY SPILLWAY	DESIGN HIGH WATER	DAM	SAFE YIELD	PERCENT CHANCE	FILL VOL (1000 CY)	HGT	TOP ELEV (MSL)	AREA (AC)	PER (\$)	AC FT
(MSL)	AC FT	IN	(\$)	(AC)	(AC)	(FT)	(MSL)	AC FT	IN	(\$)	AC FT	(MSL)	(AC)	(MSL)	(AC)	(MSL)	(AC)	(MSL)	(AC)
DA= 0.80 SQ MI = 512 AC										LATITUDE 42-20-06 LONGITUDE 71-43-34									
STREAM WATER QUALITY (B)										RUNOFF = 7.20 IN, PEAK FLOW = 330 CFS									
SITE-BL-6301										SITE-BL-6302									
SITE RATING (1)										SITE RATING (3)									
515.2	0	0.0	4	18	19480	3.2	528.4	E	177	4.1	1650	532.7	31	537.3	25	39	39	0.20	0.31
525.0	100	2.3	3510	18	19480	13.1	527.5	E	157	3.6	2230	533.0	31	537.4	25	39	39	0.20	0.31
530.2	214	5.0	2020	27	16140	18.2	532.7	E	293	6.8	1480	537.5	38	541.5	30	58	58	0.31	0.46
537.3	443	10.3	1320	37	15660	25.2	539.8	E	547	12.8	1070	543.8	50	547.5	36	94	94	0.46	0.56
542.5	661	15.5	1150	47	16090	30.5	545.0	E	793	18.6	960	547.5	59	550.5	38	125	125	0.56	0.56
DA= 1.80 SQ MI = 1152 AC										LATITUDE 42-19-30 LONGITUDE 71-44-22									
STREAM WATER QUALITY (B)										RUNOFF = 7.20 IN, PEAK FLOW = 684 CFS									
SITE-BL-6302										SITE-BL-6303									
SITE RATING (1)										SITE RATING (3)									
446.0	100	1.0	5860	19	31340	20.0	454.5	E	349	3.5	1680	457.0	41	460.0	34	36	36	0.27	0.34
448.0	142	1.5	4200	23	25740	22.0	454.5	E	352	3.6	1700	457.0	41	460.0	34	36	36	0.34	0.40
449.7	185	1.9	3460	27	23710	23.7	455.5	E	387	4.0	1650	457.9	43	460.9	35	41	41	0.40	0.49
452.5	267	2.8	2470	32	20400	26.5	455.5	E	387	4.0	1710	458.0	43	461.0	35	41	41	0.49	0.56
DA= 0.60 SQ MI = 384 AC										LATITUDE 42-19-17 LONGITUDE 71-47-02									
STREAM WATER QUALITY (B)										RUNOFF = 7.20 IN, PEAK FLOW = 247 CFS									
SITE-BL-6303										SITE-BL-6304									
SITE RATING (1)										SITE RATING (3)									
517.0	0	0.0	1	7	99690	7.0	543.9	E	133	4.1	5150	546.4	9	549.4	39	96	96	0.18	0.28
540.5	100	3.0	7450	11	93900	30.5	543.0	E	125	3.9	5960	545.4	9	548.4	38	90	90	0.18	0.28
552.9	217	6.8	4840	21	76250	42.9	555.4	E	250	7.8	4200	557.8	13	560.8	51	186	186	0.28	0.40
568.3	450	14.1	3630	21	76250	58.3	570.8	E	512	16.0	3190	573.0	26	576.0	66	370	370	0.40	0.50
581.0	800	25.0	2830	34	67120	71.1	583.5	E	893	27.9	2530	585.9	41	588.9	79	584	584	0.50	0.56

NOTES - (1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.
 (2) EMERGENCY SPILLWAY STORAGE AND COSTS ARE BASED ON TOTAL STORAGE, INCLUDING BENEFICIAL POOL.
 (3) EMERGENCY SPILLWAY TYPE CODE- C=CONCRETE CHUTE, D=CONCRETE DROP, E=EXCAVATED, T= TWO SPILLWAYS, N= NONE
 (4) TABULAR DATA ARE BASED ON PRELIMINARY INFORMATION. FIGURES SHOWN ARE PRIMARILY FOR COMPARISON PURPOSES.
 (5) ELEVATIONS ARE SHOWN TO THE NEAREST 0.1 FOOT TO SHOW VARIATION BETWEEN DEVELOPMENTS ONLY, AND ARE NOT TO BE CONSIDERED ACCURATE TO THAT DEGREE.

** DO NOT USE FOR FINAL SITE SELECTION OR LAND ACQUISITION. **

SUMMARY DATA FOR POTENTIAL UPSTREAM RESERVOIR SITES

STUDY AREA-BLACKSTONE RIVER										SUBWATERSHED QUINSIGAMOND RIVER																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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STUDY AREA-BLACKSTONE RIVER

SUBWATERSHED QUINSIGAMOND RIVER

BENEFICIAL POOL

EMERGENCY SPILLWAY

DESIGN ■ ■

DAM

SAFE

[illegible]

NOTES - (1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.

- (12) EMERGENCY SPILLWAY STORAGE AND COSTS ARE BASED ON TOTAL STORAGE, INCLUDING BENEFICIAL POOL.
(13) EMERGENCY SPILLWAY TYPE CODE- C=CONCRETE CHUTE, D=CONCRETE DROP, E=EXCAVATED, T= TWO SPILLWAYS, N= NONE
(14) TABULAR DATA ARE BASED ON PRELIMINARY INFORMATION. FIGURES SHOWN ARE PRIMARILY FOR COMPARISON PURPOSES.
(15) ELEVATIONS ARE SHOWN TO THE NEAREST 0.1 FOOT TO SHOW VARIATION BETWEEN DEVELOPMENTS ONLY, AND ARE NOT TO BE CONSIDERED ACCURATE TO THAT DEGREE.

DO NOT USE FOR FINAL SITE SELECTION OR LAND ACQUISITION.

Existing Site BL-6313(Newton Pond)

Location: On the Quinsigamond River at Sewall Street in Shrewsbury, Mass.

Worcester North & Shrewsbury, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>50</u>	<u>6</u>	<u>2,450</u>	<u>3.8</u>

Potential for Expansion: The pond is surrounded by streets and houses which limit expansion.

Remarks: The dam is an earthfill structure. The spillway is a concrete weir about 30 feet long and 4 feet deep with two feet of flashboards. Trees and brush are growing on the dam. The downstream slope has some erosion.

Ownership and Use: The pond is owned by Izreal Katz and is used for recreation. The dam is owned by the town of Spencer.

Existing Site BL-6314(Mill Pond)

Location: On West Brook about 1700 feet downstream from Main Street in Shrewsbury, Mass.

Shrewsbury, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>15</u>	<u>15</u>	<u>1,750</u>	<u>2.7</u>

Potential for Expansion: A housing development along the pond edge limits expansion.

Remarks: Old Mill Road forms the dam. The spillway is a trapezoidal concrete weir about 60 feet long which discharges flow to a two-bay concrete chute under the roadway. The outlet channel is lined with heavy riprap. The dam and spillway are in excellent condition.

Ownership and Use: The pond is owned by the Town of Shrewsbury and is used for recreation.

Existing Site BL-6315(Flint Pond and Lake Quinsigamond)

Location: On the Quinsigamond River about 400 feet upstream from Creeper Hill Road in Grafton, Mass. The major portion of the reservoir area is in Shrewsbury and Worcester.

Grafton, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>250</u>	<u>8</u>	<u>15,500</u>	<u>24.2</u>

Potential for Expansion: Many streets and hundreds of houses would be affected by expansion.

Remarks: A small dam at Lake Quinsigamond has been breached. The downstream structure at Flint Pond now controls water level in both ponds. The dam is an earthfill structure with riprapped side slopes. The principal spillway is a timber weir about 30 feet long and 5 feet deep. The emergency spillway is a two-bay weir. Each bay is 20 feet long and 5 feet deep.

Ownership and Use: The ponds are owned by the Commonwealth of Mass. and are used for recreation.

Existing Site BL-6316(Windle Pond)

Location: On Big Bummet Brook about 600 feet downstream from the Shrewsbury-Grafton town line in Grafton, Mass. About one-quarter of the pond is in Shrewsbury.

Grafton, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>5</u>	<u>15</u>	<u>1,650</u>	<u>2.6</u>

Potential for Expansion: Limited. An interchange between Routes 20 and 140 is located immediately upstream and would be affected by any expansion.

Remarks: The dam is an earthfill structure with vertical placed stone walls upstream and downstream. The principal spillway is a granite block and stone weir about 25 feet long and 2 feet deep. The spillway is downstream of and perpendicular to the main dam. Water passes over the dam through an eroded area into a storage bay and then over the weir. Trees are growing on the dam.

Ownership and Use: The pond is owned by the Wilshire Realty Trust and is used for recreation.

Existing Site BL-6317(Hovey Pond)

Location: On the Quinsigamond River about 1800 feet upstream from Route 140 in Grafton, Mass.

Grafton, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>20</u>	<u>25</u>	<u>17,200</u>	<u>26.9</u>

Potential for Expansion: Limited. Flint Pond, Lake Quinsigamond, and hundreds of houses would be affected.

Remarks: The dam is an earthfill structure with vertical stone and concrete wall faces. The spillway is a concrete ogee weir section about 30 feet long and 8 feet deep which outlets to a concrete chute and rock riprap. Trees are growing on the dam. Concrete in the spillway is cracked and crumbling in places.

Ownership and Use: The pond is owned by the Commonwealth of Mass. and is used for recreation.

Existing Site BL-6318(Pratt's Pond)

Location: On Big Bummet Brook about 100 feet upstream from Route 30 in Grafton, Mass.

Grafton, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>7</u>	<u>15</u>	<u>2,900</u>	<u>4.5</u>

Potential for Expansion: Limited. The pond is surrounded by railroads, Route 30, and houses which would be affected.

Remarks: The dam is an earthfill structure with a vertical stone retaining wall on the downstream face. The spillway is a stone weir with a concrete cap. The weir is about 30 feet long and 2 feet deep. Large trees are growing on the dam.

Ownership and Use: The pond is owned by Christian Aussenheimer and is used for recreation.

Existing Site BL-6319(Hayes Pond)

Location: On Big Bummet Brook about 250 feet upstream from East Street in Grafton, Mass.

Grafton, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>10</u>	<u>8</u>	<u>3,050</u>	<u>4.8</u>

Potential for Expansion: The pond is surrounded by streets, houses, and a cemetery which limit expansion.

Remarks: The dam is an earthfill structure. The principal spillway is a concrete weir about 30 feet long and 3 feet deep. There is also an auxiliary concrete and stone spillway with flashboards near the left abutment. This spillway is 4 feet wide and 5 feet deep. Trees and brush are growing on the dam. Concrete in the principal spillway is cracked.

Ownership and Use: The pond is owned by Frank Hayes Estate and is used for recreation.

Existing Site BL-6320(Lake Ripple)

Location: On the Quinsigamond River about 400 feet upstream from Brigham Hill Road in Grafton, Mass.

Grafton, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>70</u>	<u>10</u>	<u>22,950</u>	<u>35.9</u>

Potential for Expansion: Limited. The Grafton High School, Massachusetts Turnpike, and many houses would be affected.

Remarks: The dam is an earthfill structure with vertical stone walls. The principal spillway is a granite block and concrete weir about 30 feet long and 3 feet deep. There is also a gate controlled sluiceway with flashboards on the right abutment. There are 4 bays; each bay is 3 feet wide and 8 feet deep. There is also a small gated outlet to the left of the principal spillway. Water also passes over the stone wall portion of the dam.

Ownership and Use: The lake is owned by the Town of Grafton and is used for recreation.

Existing Site BL-6321(Fisherville Pond)

Location: On the Quinsigamond River about 700 feet upstream from Route 122A in Grafton, Mass.

Grafton, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>100</u>	<u>20</u>	<u>85,600</u>	<u>133.8</u>

Potential for Expansion: Limited. Site BL-6320(Lake Ripple) is located immediately upstream.

Remarks: The dam is an earthfill and granite block structure. The principal spillway is a granite block weir about 200 feet long and 10 feet deep. There is also a small gate controlled spillway adjacent to the weir. There is a large mill located immediately downstream.

Ownership and Use: The pond is owned by Kaltsas Brothers and Liton Industries, and is used to store water.



BL-6313
Newton Pond



BL-6316
Windle Pond



BL-6314
Mill Pond



BL-6317
Hovey Pond



BL-6315
Flint Pond and
Lake Quinsigamond





BL-6318
Pratts Pond



BL-6319
Hayes Pond

BL-6320
Lake Ripple



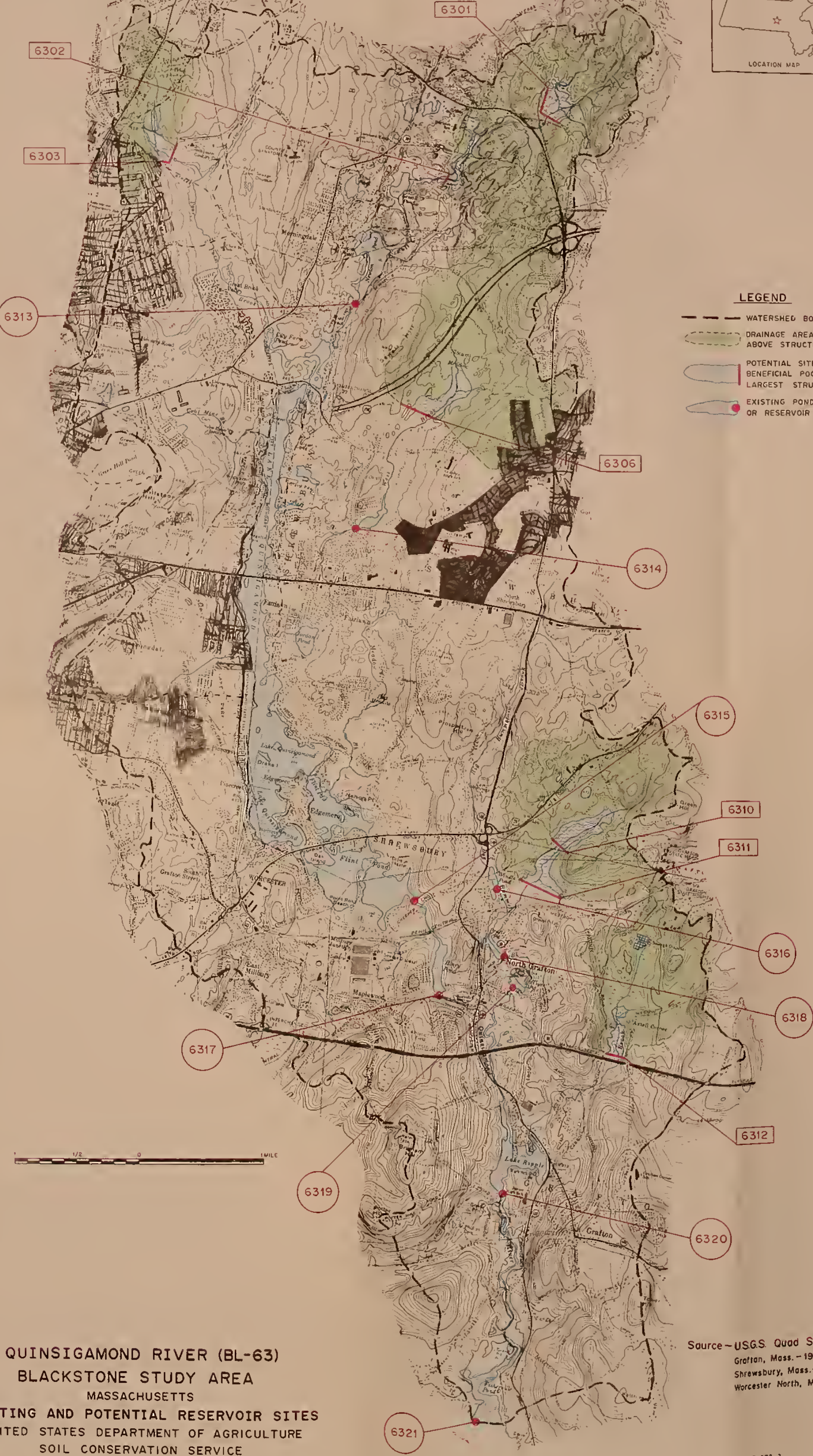
BL-6321
Fisherville Pond





LEGEND

- WATERSHED BOUNDARY
- DRAINAGE AREA ABOVE STRUCTURE
- POTENTIAL SITE SHOWING BENEFICIAL POOL FOR LARGEST STRUCTURE
- EXISTING POND OR RESERVOIR



QUINSIGAMOND RIVER (BL-63)

BLACKSTONE STUDY AREA

MASSACHUSETTS

EXISTING AND POTENTIAL RESERVOIR SITES

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

Source-USGS Quad Sheets
Grafton, Mass.-1969
Shrewsbury, Mass.-1969
Worcester North, Mass.-1960

BLACKSTONE STUDY AREA
SITE DATA FOR

Subwatershed BL-64, Blackstone River

The Blackstone River subwatershed covers about 31,700 acres in Blackstone, Douglas, Grafton, Millville, Northbridge, Sutton, Upton and Uxbridge; all in Worcester County.

The subwatershed includes the drainage area of the Blackstone River from the confluence of the Quinsigamond River in Grafton, Massachusetts downstream to the Massachusetts-Rhode Island border in Blackstone, Massachusetts. The subwatershed also includes several brooks in Douglas and Uxbridge, Massachusetts which ultimately join the Blackstone River in Rhode Island.

Geology of the potential reservoir sites is characterized by 10 to 25 feet of glacial drift, glacial till, or outwash sand and gravel underlain by granitic gneiss or schist bedrock.

Nineteen potential reservoir sites and 6 existing reservoirs were studied.

POTENTIAL SITE BL-6401

Location:	On Rocky Brook at the old railroad bed about 3,700 feet upstream of Southwest Main Street in Douglas, Mass.
	Oxford-Mass.-Conn.-Rhode Island USGS quadrangle
	Latitude: 42°02'06" Longitude: 71°47'37"
Facilities Affected:	None below elevation 680.
Geologic Conditions:	Both abutments are dense glacial till; probably shallow to schist bedrock. Depth to schist bedrock in the foundation is estimated to be from 10 to 15 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.
Engineering Notes:	The right abutment is recommended for the excavated emergency spillway location.
Public Ownership:	The dam site and about one-half of the potential pool area are within the Douglas State Forest.

POTENTIAL SITE BL-6402

Location: On Rocky Brook about 3,600 feet upstream from the Conn.-Mass. state line in Douglas, Mass.

Oxford, Mass.-Conn.-Rhode Island USGS quadrangle

Latitude: 42°01'20"

Longitude: 71°47'37"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	Southwest Main Street	550

Geologic Conditions: Both abutments are dense englacial drift with cobbles and boulders; probably shallow to bedrock. Depth to grey schist bedrock in the foundation is estimated to be from 10 to 15 feet. Waterholding capabilities appear to be poor. Leakage is expected through both abutments. Pervious borrow material for dam construction was located near the site; impervious material was not located.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

Public Ownership: The dam site and a small portion of the potential pool area are within the Douglas State Forest.

POTENTIAL SITE BL-6404

Location: On Tinkerville Brook about 1,500 feet upstream from Walnut Street in Douglas, Mass.

Uxbridge, Mass.-Rhode Island USGS quadrangle

Latitude: 42°01'46"

Longitude: 71°44'33"

Facilities	None below elevation 570
Affected:	

Geologic Conditions: Both abutments are granitic gneiss bedrock. Depth to granitic gneiss bedrock in the foundation is estimated to be less than 10 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6405

Location: On Tinkerville Brook approximately 100 feet upstream from Chestnut Street in Douglas, Mass.

Uxbridge, Mass.-Rhode Island USGS quadrangle

Latitude: 42°01'17"

Longitude: 71°43'45"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	2 Houses	520
	2 Sheds	520
	Walnut Street	515
	2 Sheds	515
	House	515

Geologic Conditions: The left abutment is thin discontinuous englacial drift with granitic gneiss outcrops. The right abutment is englacial drift. Depth to granitic gneiss bedrock in the foundation is estimated to be from 5 to 15 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6406

Location: On Tinkerville Brook about 900 feet upstream from Hemlock Street in Douglas, Mass.

Uxbridge, Mass.-Rhode Island USGS quadrangle

Latitude: 42°01'02"

Longitude: 71°43'27"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	2 Houses	520
	2 Sheds	520
	House	515
	2 Sheds	515
	House	510
	Shed	510
	Chestnut Street	510
	Walnut Street	510

Geologic Conditions: The left abutment is dense glacial till. The right abutment is outwash sand and gravel or englacial drift. Depth to gneiss or schist bedrock in the foundation is estimated to be from 10 to 20 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6407

Location: On Bating Brook about 3,000 feet upstream of Pine Street in Douglas, Mass.

Uxbridge, Mass.-Rhode Island USGS quadrangle

Latitude: 42°01'51" Longitude: 71°43'15"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	House	500
	Garage	500

Geologic Conditions: The left abutment is outwash sand and gravel. The right abutment is dense glacial till. Depth to gneiss or schist bedrock in the foundation is estimated to be from 20 to 25 feet. Waterholding capabilities appear to be poor. Leakage is expected through the left abutment and the foundation. Borrow material for dam construction was located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6408

Location: On Bating Brook about 400 feet upstream of Pine Street in Douglas, Mass.

Uxbridge, Mass.-Rhode Island USGS quadrangle

Latitude: 42°01'21" Longitude: 71°43'03"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	House	480
	House	475
	Shed	475
	3 Houses	470
	2 Sheds	470
	Store	460
	Pavillion	460

Geologic Conditions: The left abutment is outwash sand and gravel. The right abutment is englacial drift. Depth to gneiss or schist bedrock in the foundation is estimated to be from 20 to 25 feet. Waterholding capabilities appear to be poor. Leakage is expected through both abutments and the foundation. Pervious borrow material for dam construction was located near the site; impervious material was not located.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6410

Location: On an unnamed tributary to Round Top Brook about 2,000 feet upstream of Pine Street in Douglas, Mass.

Uxbridge, Mass.-Rhode Island USGS quadrangle

Latitude: 42°01'53" Longitude: 71°42'41"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	Southeast Main Street	530

Geologic Conditions: Both abutments are poorly graded sand and gravel. Granitic gneiss outcrops high on the right abutment. Depth to granitic gneiss bedrock in the foundation is estimated to be from 15 to 25 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6412

Location: On Laurel Brook about 3,200 feet upstream of Yew Street in Douglas, Mass.

Uxbridge, Mass.-Rhode Island USGS quadrangle

Latitude: 42°03'02" Longitude: 71°41'26"

Facilities	None below elevation 550.
Affected:	

Geologic Conditions: The left abutment is thin discontinuous englacial drift with granitic gneiss outcrops. The right abutment is dense glacial till. Granitic gneiss bedrock outcrops in the foundation. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6413

Location: On the Chockalog River about 700 feet upstream from the Massachusetts-Rhode Island state line in Douglas, Mass.

Uxbridge, Mass.-Rhode Island USGS quadrangle

Latitude: 42°00'44"

Longitude: 71°41'04"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	House	480
	2 Trailers	480
	Barn	480
	Southeast Main Street	475

Geologic Conditions: Both abutments are outwash sand and gravel. Granitic gneiss outcrops high on the left abutment. Depth to granitic gneiss bedrock in the foundation is estimated to be from 30 to 40 feet. Waterholding capabilities appear to be poor. Leakage is expected through both abutments and the foundation. Pervious borrow material for dam construction was located near the site; impervious material was not located.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6414

Location: On Cedar Swamp Brook about 100 feet upstream of West Street in Uxbridge, Mass.

Uxbridge, Mass.-Rhode Island USGS quadrangle

Latitude: 42°01'16"

Longitude: 71°40'38"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	Aldrich Street	490

Geologic Conditions: The left abutment is dense glacial till. The right abutment is englacial drift. Depth to granitic gneiss bedrock in the foundation is estimated to be from 10 to 20 feet. Waterholding capabilities appear to be fair to poor. Leakage is expected on the right abutment. Borrow material for dam construction was located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6415

Location: On Laurel Brook about 100 feet upstream of West Street in Uxbridge, Mass.

Uxbridge, Mass.-Rhode Island USGS quadrangle

Latitude: 42°01'58"

Longitude: 71°40'18"

Facilities Affected: None below elevation 480.

Geologic Conditions: Both abutments are outwash sand and gravel. Depth to granitic gneiss bedrock in the foundation is estimated to be from 15 to 20 feet. Waterholding capabilities appear to be poor. Leakage is expected through both abutments and the foundation. Pervious borrow material for dam construction was located near the site; impervious material was not located.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6416

Location: On Scadden Brook about 500 feet upstream of the Penn Central Railroad in Uxbridge, Mass.

Uxbridge, Mass.-Rhode Island USGS quadrangle

Latitude: 42°03'13"

Longitude: 71°40'24"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	Route 16	440

Geologic Conditions: Both abutments are thin discontinuous glacial drift, shallow to schist bedrock. Depth to schist bedrock in the foundation is estimated to be from 15 to 25 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6417

Location: On Happy Hollow Brook about 2,700 feet upstream of Mill Street in Uxbridge, Mass.

Uxbridge, Mass.-Rhode Island USGS quadrangle

Latitude: $42^{\circ}03'16''$ Longitude: $71^{\circ}38'30''$

Facilities None below elevation 410.
Affected:

Geologic Both abutments are englacial drift, probably shallow to bedrock.
Conditions: Depth to schist bedrock in the foundation is estimated to be from 10 to 15 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering The left abutment is recommended for the excavated emergency
Notes: spillway location.

POTENTIAL SITE BL-6419

Location: At Aldrich Pond about 150 feet upstream of Aldrich Street in Uxbridge, Mass.

Uxbridge, Mass.-Rhode Island USGS quadrangle

Latitude: $42^{\circ}01'41''$ Longitude: $71^{\circ}38'28''$

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	Chockalog Street	435
	Buried Telephone Cable	420

Geologic The left abutment is granitic gneiss overlain by thin dis-
Conditions: tinuous englacial drift. The right abutment is englacial drift. Depth to granitic gneiss bedrock in the foundation is estimated to be from 15 to 20 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering The right abutment is recommended for the excavated emergency
Notes: spillway location.

POTENTIAL SITE BL-6420

Location: On Emerson Brook about 400 feet upstream of Route 146 in Uxbridge, Mass.

Uxbridge, Mass.-Rhode Island USGS quadrangle

Latitude: 42°02'47" Longitude: 71°37'43"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	House	310
	Junk Yard	310

Geologic Conditions: The left abutment is outwash sand and gravel. The right abutment is dense glacial till. Depth to gneiss bedrock in the foundation is estimated to be from 5 to 15 feet. Waterholding capabilities appear to be fair to good. Leakage is expected through the left abutment. Borrow material for dam construction was located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6421

Location: On Aldrich Brook about 800 feet downstream from Elmwood Avenue in Uxbridge, Mass.

Blackstone and Uxbridge, Mass.-Rhode Island USGS quadrangles

Latitude: 42°01'13" Longitude: 71°37'26"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	Elmwood Avenue	285

Geologic Conditions: The left abutment is dense glacial till. The right abutment is outwash sand and gravel. Depth to granite bedrock in the foundation is estimated to be from 15 to 20 feet. Waterholding capabilities appear to be fair to poor. Leakage is expected through the right abutment. Borrow material for dam construction was located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6422

Location: On Fox Brook about 1,300 feet upstream from Lincoln Street in Blackstone, Mass.

Blackstone, Mass.-Rhode Island USGS quadrangle

Latitude: $42^{\circ}02'03''$

Longitude: $71^{\circ}32'26''$

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	House	250
	2 Houses	245
	House	235
	Mendon Street	235

Geologic Conditions: The left abutment is dense glacial till. The right abutment is englacial drift with a gravel terrace on the slope. Depth to granite bedrock in the foundation is estimated to be from 5 to 10 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

STUDY AREA-BLACKSTONE RIVER															SUBWATERSHED BLACKSTONE RIVER																																												
BENEFICIAL POOL															EMERGENCY SPILLWAY															DESIGN															DAM														
ELEV	STORAGE	COST PER AC FT	AREA (AC)	COST/ SURF AC	DEPTH AT DAM	CREST ELEV	STORAGE AT CREST	COST PER AC FT	TOP ELEV	HGT	FILL VOL (1000 CY)	PERCENT CHANCE	AT 95	SAFE YIELD																																													
(MSL)	AC FT	IN	(AC)	(\$)	(FT)	(MSL)	AC FT	IN	(MSL)	(AC)	(MSL)	FT	(MGD)																																														
DA= 2.10 SQ MI = 1344 AC															USGS QUAD- UXBRIDGE															LATITUDE 42-01-17															LONGITUDE 71-43-45														
STREAM WATER QUALITY (B)															100-YR PRIN SPWY DESIGN STORM															RUNOFF = 7.00 IN, PEAK FLOW =															841 CFS														
SITE-BL-6405																																																											
SITE RATING (1)																																																											
493.0	0	0.0	7	24110	7.0	507.4	E	465	4.1	1010	509.7	86	512.8	27	73	0.28																																											
500.0	100	0.8	22	9580	14.0	508.5	E	545	4.9	980	511.0	93	514.0	28	81	0.78																																											
508.4	524	4.6	77	8450	22.4	512.9	E	951	8.5	780	515.4	121	518.4	32	119	1.30																																											
516.7	1372	12.3	128	8650	30.7	519.2	E	1729	15.3	630	521.5	158	524.5	39	197	1.62																																											
522.5	2218	19.7	640	163	8650	36.5	525.0	E	2662	23.7	530	527.0	189	44	290																																												
*****															*****															*****															*****														
DA= 3.80 SQ MI = 2432 AC															USGS QUAD- UXBRIDGE															LATITUDE 42-01-02															LONGITUDE 71-43-27														
STREAM WATER QUALITY (B)															100-YR PRIN SPWY DESIGN STORM															RUNOFF = 7.00 IN, PEAK FLOW =															1522 CFS														
SITE-BL-6406																																																											
SITE RATING (1)																																																											
463.9	0	0.0	6	72510	9.8	498.2	E	1167	5.8	920	500.7	109	504.4	50	279	0.34																																											
474.0	100	0.5	15	18480	20.0	474.0	T	130	0.6	8440	488.9	42	493.7	40	139	1.40																																											
495.9	928	4.6	79	21950	41.9	504.4	E	1875	9.3	770	506.7	168	509.9	56	376	2.40																																											
508.7	2583	12.7	188	11130	54.8	513.3	E	3524	17.4	590	515.8	230	519.3	65	586	3.16																																											
520.0	5067	25.0	253	11340	66.0	522.5	E	5762	28.4	500	525.0	289	528.0	74	838																																												
*****															*****															*****															*****														
DA= 0.90 SQ MI = 576 AC															USGS QUAD- UXBRIDGE															LATITUDE 42-01-51															LONGITUDE 71-43-15														
STREAM WATER QUALITY (B)															100-YR PRIN SPWY DESIGN STORM															RUNOFF = 7.00 IN, PEAK FLOW =															361 CFS														
SITE-BL-6407																																																											
SITE RATING (3)																																																											
479.0	40	0.8	7	29530	1.0	487.2	E	239	5.0	2050	489.5	44	492.5	15	69	0.12																																											
482.7	100	2.0	23	25330	4.6	485.2	E	174	3.5	3890	487.7	38	490.7	13	54	0.21																																											
485.7	184	3.8	32	21950	7.8	488.2	E	282	5.9	2900	490.7	47	493.7	16	78	0.30																																											
490.2	353	7.3	45	21950	12.2	492.7	E	484	10.1	2060	495.0	59	498.0	20	121	0.43																																											
492.5	468	9.8	52	17560	14.5	495.0	E	614	12.8	1480	497.2	65	500.2	22	162	0.50																																											
*****															*****															*****															*****														

NOTES - (1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.

- (2) EMERGENCY SPILLWAY STORAGE AND COSTS ARE BASED ON TOTAL STORAGE, INCLUDING BENEFICIAL POOL.
- (3) EMERGENCY SPILLWAY TYPE CODE- C=CONCRETE CHUTE, D=CONCRETE DROP, E=EXCAVATED, T= TWO SPILLWAYS, N= NONE
- (4) TABULAR DATA ARE BASED ON PRELIMINARY INFORMATION. FIGURES SHOWN ARE PRIMARILY FOR COMPARISON PURPOSES.
- (5) ELEVATIONS ARE SHOWN TO THE NEAREST 0.1 FOOT TO SHOW VARIATION BETWEEN DEVELOPMENTS ONLY, AND ARE NOT TO BE CONSIDERED ACCURATE TO THAT DEGREE.

DO NOT USE FOR FINAL SITE SELECTION OR LAND ACQUISITION.

SUMMARY DATA FOR POTENTIAL UPSTREAM RESERVOIR SITES

STUDY AREA- BLACKSTONE RIVER									
BENEFICIAL POOL									
ELEV	STORAGE	PER	AREA	COST/	DEPTH	AT	CREST	STORAGE	EMERGENCY SPILLWAY
(MSL)	AC FT	(\$)	(AC)	AC	(FT)	DAM	ELEV	AT CREST	* HIGH WATER *
									* DESIGN *
									* DAM
									* YIELD
									* PERCENT
									* CHANCE
									* AT 95
									* FILL
									* VOL
									* (1000
									* CY) *
									* (MGD)
									* LATITUDE
									* 42-01-21
									* LONGITUDE
									* 71-43-03
									* RUNOFF =
									* 7.00 IN, PEAK FLOW =
									* 521 CFS
									* LATITUDE
									* 42-01-53
									* LONGITUDE
									* 71-42-41
									* RUNOFF =
									* 7.00 IN, PEAK FLOW =
									* 240 CFS
									* LATITUDE
									* 42-01-53
									* LONGITUDE
									* 71-42-41
									* RUNOFF =
									* 7.00 IN, PEAK FLOW =
									* 240 CFS
									* LATITUDE
									* 42-01-53
									* LONGITUDE
									* 71-42-41
									* RUNOFF =
									* 7.00 IN, PEAK FLOW =
									* 240 CFS
									* LATITUDE
									* 42-01-53
									* LONGITUDE
									* 71-42-41
									* RUNOFF =
									* 7.00 IN, PEAK FLOW =
									* 240 CFS
									* LATITUDE
									* 42-01-53
									* LONGITUDE
									* 71-42-41
									* RUNOFF =
									* 7.00 IN, PEAK FLOW =
									* 240 CFS
									* LATITUDE
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									* LONGITUDE
									* 71-42-41
									* RUNOFF =
									* 7.00 IN, PEAK FLOW =
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									* LONGITUDE
									* 71-42-41
									* RUNOFF =
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									* 240 CFS
									* LATITUDE
									* 42-01-53
									* LONGITUDE
									* 71-42-41
									* RUNOFF =
									* 7.00 IN, PEAK FLOW =
									* 240 CFS
									* LATITUDE
									* 42-01-53
									* LONGITUDE
									* 71-42-41

SUBWATERSHED BLACKSTONE RIVER

STUDY AREA- BLACKSTONE RIVER

BENEFICIAL POOL

DAM ■ SAFE

	★										★ HIGH WATER ★										★ YIELD AT 95									
1	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
2	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
3	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
4	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
5	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
6	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
7	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
8	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
9	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
11	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
12	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
13	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
14	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
15	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
16	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
17	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
18	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
19	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
20	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
21	1</																													

ELEV	STORAGE	COST PER AC FT	AREA	COST/ SURF AC	DEPTH AT DAM	* CREST * ELEV *+ TYPE	STORAGE AT CREST	COST PER AC FT	* ELEV (MSL)	AREA (AC)	* ELEV (MSL)	TOP * ELEV (MSL)	HGT	FILL VOL (1000 CY)	*PERCENT *CHANGE * (MGD)
(MSL)	AC FT	IN	(AC)	(\$)	(FT)	(MSL)	AC FT	IN	(\$)	(AC)	(MSL)	(MSL)	FT		

SITE-BL-6412

DA=	0.50	SQ MI =	320	AC	USGS QUAD=	UXBRIDGE	LATITUDE	42-03-02	LONGITUDE	71-41-26
STREAM WATER	QUALITY (B)	100-YR PRIN	SPWY	DESIGN	STORM	RUNOFF =	7.00	IN, PEAK	FLOW =	200 CFS
SITE RATING	(1)									

[illegible]

SITE-BL-6413
SITE RATING (3)
DA= 2.80 SQ MI = 1792 AC
STREAM WATER QUALITY (B)
USGS QUAD- UXBRIDGE
100-YR PRIN SPWY DESIGN STORM
LATITUDE 42-00-44 LONGITUDE 71-41-04
RUNOFF = 7.00 IN, PEAK FLOW = 795 CFS

[illegible]

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SITE-BL-6414
SITE RATING (2) 480.4 0 0.0 8 2.4 * 484.7 E 243 4.1 1110 * 486.9 135 * 490.0 12 8 * *****
STREAM WATER QUALITY (B) 100-YR PRIN SPWY DESIGN STORM RUNOFF = 7.00 IN, PEAK FLOW = 441 CFS
USGS QUAD- UXBRIDGE
DA= 1.10 SQ MI = 704 AC
LATITUDE 42-01-16 LONGIT*DE 71-40-38
***** THIS SITE LACKS SUFFICIENT STORAGE FOR BENEFICIAL WATER. *****

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NOTES - (1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.

AGE, INCLUDING BENEFICIAL POOL.

(3) EMERGENCY SPILLWAY TYPE CODE- C=CONCRETE CHUTE, D=CONCRETE DROP, E=EXCAVATED, T= TWO SPILLWAYS, N= NONE

(4) TABULAR DATA ARE BASED ON PRELIMINARY INFORMATION. FIGURES SHOWN ARE PRIMARILY FOR COMPARISON PURPOSES.

(15) ELEVATIONS ARE SHOWN TO THE NEAREST 0.1 FOOT TO SHOW VARIATION BETWEEN DEVELOPMENTS ONLY, AND ARE NOT TO BE CONSIDERED ACCURATE TO THAT DEGREE.

*** DO NOT USE FOR FINAL SITE SELECTION OR LAND ACQUISITION. ***

STUDY AREA-BLACKSTONE RIVER															SUBWATERSHED BLACKSTONE RIVER														
BENEFICIAL POOL										EMERGENCY SPILLWAY					DESIGN * HIGH WATER *					DAM									
ELEV	STORAGE	COST PER AC FT	AREA (AC)	COST/ SURF AC (\$)	DEPTH AT DAM (FT)	CREST ELEV *+ (MSL)	STORAGE AT CREST	COST PER AC FT	TOP * ELEV (MSL)	AREA (AC)	ELEV (MSL)	HGT VOL (1000 CY)	FILL *CHANCE	SAFE * YIELD															
(MSL)	AC FT	IN	(\$)				AC FT	IN	(\$)																				
DA= 1.80 SQ MI = 1152 AC															LATITUDE 42-01-58 LONGITUDE 71-40-18														
USGS QUAD- UXBRIDGE															RUNOFF = 7.00 IN, PEAK FLOW = 721 CFS														
100-YR PRIN SPWY DESIGN STORM															* * * * *														
SITE-BL-6415															* * * * *														
SITE RATING	(3)																												
454.5	0	0.0	10		2.5	465.5	E 398	4.1	1350	468.0	79	471.0	19	83															
459.5	100	1.0	6710	30	22560	462.0	E 207	2.2	3240	464.5	58	467.5	16	51															
464.2	299	3.0	3300	57	17400	466.7	E 475	4.9	2070	469.0	86	472.0	20	94															
469.7	697	7.3	1950	89	15250	472.2	E 965	10.1	1410	474.5	133	477.5	26	161															
472.5	982	10.2	1580	114	13690	475.0	E 1308	13.6	1190	477.2	156	480.2	28	207															
*****															*****														
DA= 1.30 SQ MI = 832 AC															LATITUDE 42-03-13 LONGITUDE 71-40-24														
USGS QUAD- UXBRIDGE															RUNOFF = 7.00 IN, PEAK FLOW = 521 CFS														
100-YR PRIN SPWY DESIGN STORM															* * * * *														
SITE-BL-6416															* * * * *														
SITE RATING	(1)																												
410.7	0	0.0	3		6.6	429.9	E 288	4.1	1910	434.0	73	438.7	35	101															
424.0	100	1.4	5760	21	28050	426.5	E 173	2.5	3340	433.0	66	437.7	34	92															
427.2	182	2.5	3480	32	20080	429.7	E 281	4.1	2250	435.0	81	439.4	35	106															
429.5	264	3.8	2550	40	16980	432.0	E 395	5.6	1710	435.9	88	439.4	35	106															
432.5	413	6.0	2150	61	14570	435.0	E 603	8.7	1480	437.4	99	440.4	36	120															
*****															*****														
DA= 0.50 SQ MI = 320 AC															LATITUDE 42-03-16 LONGITUDE 71-38-30														
USGS QUAD- UXBRIDGE															RUNOFF = 7.00 IN, PEAK FLOW = 200 CFS														
100-YR PRIN SPWY DESIGN STORM															* * * * *														
SITE-BL-6417															* * * * *														
SITE RATING	(1)																												
366.5	0	0.0	1		6.5	390.5	E 111	4.1	3710	394.7	13	399.2	39	74															
389.7	100	3.8	4960	8	60560	392.2	E 128	4.8	3880	397.7	16	401.7	42	87															
393.7	140	5.1	4030	12	47070	396.2	E 177	6.6	3190	400.9	19	404.9	45	107															
399.1	219	8.2	3070	17	38480	401.6	E 270	10.1	2480	405.7	23	409.6	50	141															
402.5	284	10.7	2690	20	37460	405.0	E 342	12.8	2240	407.5	25	410.5	51	155															

NOTES - (1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.

- (12) EMERGENCY SPILLWAY STORAGE AND COSTS ARE BASED ON TOTAL STORAGE, INCLUDING BENEFICIAL POOL.
(13) EMERGENCY SPILLWAY TYPE CODE- C=CONCRETE CHUTE, D=CONCRETE DROP, E=EXCAVATED, T= TWO SPILLWAYS, N= NONE
(14) TABULAR DATA ARE BASED ON PRELIMINARY INFORMATION. FIGURES SHOWN ARE PRIMARILY FOR COMPARISON PURPOSES.
(15) ELEVATIONS ARE SHOWN TO THE NEAREST 0.1 FOOT TO SHOW VARIATION BETWEEN DEVELOPMENTS ONLY, AND ARE NOT TO BE CONSIDERED ACCURATE TO THAT DEGREE.

*** DO NOT USE FOR FINAL SITE SELECTION OR LAND ACQUISITION. ***

SUMMARY DATA FOR POTENTIAL UPSTREAM RESERVOIR SITES

STUDY AREA- BLACKSTONE RIVER										SUBWATERSHED BLACKSTONE RIVER																																							
BENEFICIAL POOL										EMERGENCY SPILLWAY										DESIGN HIGH WATER										DAM										SAFE YIELD									
ELEV	STORAGE	COST PER AC FT	AREA (AC)	COST/ SURF AC (\$)	DEPTH AT DAM (FT)	CREST ELEV	STORAGE AT CREST	COST PER AC FT (\$)	MSL	++ TYPE	AC FT	IN	QUAD- UXB	PRIN SPWY	DESIGN STORM	USGS QUAD- UXB	PRIN SPWY	DESIGN STORM	COST PER AC FT (\$)	MSL	AC	FT	TOP ELEV	HGT VOL	FILL VOL	PERCENT CHANCE	AT 95																						
(MSL)	AC FT	IN	(\$)	(AC)	(FT)	(MSL)	AC FT	IN	(MSL)	(AC)	FT	(MSL)	(AC)	FT	(MSL)	(AC)	FT	(MSL)	(AC)	FT	(MSL)	(AC)	FT	(MSL)	(AC)	FT	(MSL)	(AC)	FT																				
DA= 0.60 SQ MI = 384 AC										USGS QUAD- UXB										LATITUDE 42-01-41										LONGITUDE 71-38-28																			
STREAM WATER QUALITY (B)										100-YR PRIN SPWY										DESIGN STORM										RUNOFF = 7.00 IN, PEAK FLOW = 240 CFS																			
SITE-8L-6419										RATING (1)										RATING (2)										RATING (3)																			
406.5	15	0.5	3	21710	2.5	420.0	E	148	4.6	1800	*	422.4	27	*	425.4	21	30	*	0.05																														
417.4	100	3.0	15	21710	13.3	419.9	E	145	4.5	2210	*	422.2	26	*	425.2	21	30	*	0.18																														
422.9	211	6.6	28	15120	18.9	425.4	E	297	9.3	1440	*	427.7	45	*	430.7	27	61	*	0.27																														
428.5	433	13.5	48	13050	24.6	431.0	E	566	17.7	1120	*	433.2	53	*	437.0	33	111	*	0.39																														
432.5	634	19.7	53	13750	28.5	435.0	E	772	24.1	950	*	436.9	53	*	439.9	36	143	*	0.46																														
DA= 7.30 SQ MI = 4672 AC										USGS QUAD- UXB										LATITUDE 42-02-47										LONGITUDE 71-37-43																			
STREAM WATER QUALITY (B)										100-YR PRIN SPWY										DESIGN STORM										RUNOFF = 7.00 IN, PEAK FLOW = 1937 CFS																			
SITE-8L-6420										RATING (1)										RATING (2)										RATING (3)																			
297.6	100	0.3	31	25870	19.6	297.6	T	158	0.4	5070	*	306.6	56	*	309.7	32	88	*	0.41																														
299.2	152	0.4	37	21320	21.2	299.2	T	210	0.5	3710	*	306.2	55	*	309.2	31	83	*	0.55																														
300.5	204	0.5	41	21030	22.5	300.5	T	262	0.7	3270	*	307.5	58	*	310.5	33	103	*	0.67																														
301.7	255	0.7	44	20900	23.7	301.7	T	314	0.8	2920	*	307.7	58	*	310.7	33	107	*	0.79																														
302.5	289	0.7	46	20360	24.5	302.5	T	348	0.8	2670	*	307.7	59	*	310.7	33	111	*	0.86																														
DA= 1.50 SQ MI = 960 AC										USGS QUAD- BLACKSTONE										LATITUDE 42-01-13										LONGITUDE 71-37-26																			
STREAM WATER QUALITY (B)										100-YR PRIN SPWY										DESIGN STORM										RUNOFF = 7.00 IN, PEAK FLOW = 601 CFS																			
SITE-8L-6421										RATING (1)										RATING (2)										RATING (3)																			
290.1	10	0.1	6	27490	4.1	304.9	T	342	4.3	2190	*	307.2	65	*	310.2	24	56	*	0.05																														
297.6	100	1.2	18	27490	11.6	300.1	E	163	2.0	3070	*	305.7	55	*	309.2	23	44	*	0.25																														
299.6	139	1.7	21	25940	13.6	302.1	E	221	2.8	2510	*	306.7	61	*	309.9	24	49	*	0.31																														
301.1	178	2.2	29	26330	15.1	303.6	E	279	3.5	2700	*	307.1	64	*	310.1	24	52	*	0.36																														
302.5	223	2.8	37	20270	16.5	302.5	T	235	2.9	3170	*	307.4	65	*	310.4	24	60	*	0.41																														

Existing Site BL-6423(Rice City Pond)

Location: On the Blackstone River at Hartford Road in Uxbridge, Mass. One-half of the pool area is in Northbridge, Mass.

Blackstone, Mass.-R. I. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>115</u>	<u>10</u>	<u>7,550</u>	<u>11.8</u>

Potential for Expansion: Raising the pond level by 10 feet would affect few facilities. Surface area would be nearly tripled.

Remarks: Hartford Road forms the dam. The principal spillway is a grouted granite block weir about 50 feet long and 10 feet deep. The emergency spillway is a concrete weir about 75 feet long and 10 feet deep. There is a gate control at the emergency spillway which serves the old Blackstone Canal. Trees and brush are growing on both slopes of the dam.

Ownership and Use: The pond is owned by Steven Mill Co. and is used for water storage.

Existing Site BL-6424(Crane Pond)

Location: On Fox Brook just upstream from Mendon St. in Blackstone, Mass.

Blackstone, Mass. R. I. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>10</u>	<u>5</u>	<u>1,650</u>	<u>2.6</u>

Potential for Expansion: Raising the pond level by 10 feet would affect 4 houses. Surface area would be nearly tripled. Any expansion above 10 feet would require excessive diking.

Remarks: The dam is an earthfill structure. The spillway is a concrete weir about 5 feet long and 4 feet deep. The spillway is equipped for flashboards. Trees and brush are growing on the dam. Concrete is broken on the upstream side of the spillway.

Ownership and Use: The pond is owned by Richard Marchant and is used for recreation.

Existing Site BL-6425(Ironstone Reservoir)

Location: On Bacon Brook about 400 feet upstream from the Penn-Central Railroad in Uxbridge, Mass.

Blackstone, Mass. R.I. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>25</u>	<u>8</u>	<u>3,650</u>	<u>5.7</u>

Potential for Expansion: Raising the reservoir level by 15 feet would affect two streets and about 5 houses. Surface area would be increased to over 200 acres.

Remarks: The dam is an earthfill structure. The principal spillway is a concrete ogee weir section about 25 feet long and 2 feet deep. There is also a flashboard-controlled spillway on the right abutment. Trees and brush are growing on the dam. Concrete in both spillways has cracked and crumbled.

Ownership and Use: The reservoir is owned by Raymond A. Bergerson and Sons and is used for recreation and wildlife habitat.

Existing Site BL-6426(Lee Reservoir)

Location: On Scadden Brook about 1000 feet downstream from West Street in Uxbridge, Mass.

Uxbridge, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>15</u>	<u>15</u>	<u>1,250</u>	<u>2.0</u>

Potential for Expansion: Raising the reservoir level by 15 feet would affect West Street and a Sportsman's Club building. Surface area would be increased to over 80 acres.

Remarks: The dam is a gravel-fill structure. The principal spillway is a badly deteriorated concrete and stone weir about 100 feet long and 6 feet deep. There is also a non-functioning 24-inch diameter metal pipe spillway. Seepage was observed all along the downstream toe of the dam.

Ownership and Use: The reservoir is owned by J. B. Farnum and Sons and is used as a mill reservoir.

Existing Site BL-6427 (Lee Pond)

Location: On Emerson Brook about 1800 feet downstream from the Penn-Central Railroad in Uxbridge, Mass.

Uxbridge, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>10</u>	<u>20</u>	<u>3,550</u>	<u>5.5</u>

Potential for Expansion: Steep topography limits any significant increase in surface area. The Penn-Central Railroad crosses the upstream end of the pool.

Remarks: The dam is an earthfill structure. The principal spillway, located on the right abutment, is a channel excavated to ledge. The channel is about 50 feet wide and 5 feet deep. There is also a gate-controlled spillway on the left abutment which leads to an old mill building. Slopes of the dam are steep. Large trees are growing on the dam. Seepage was observed at many areas on the downstream toe.

Ownership and Use: The pond is owned by Vasil and Bessie Christo and is used for recreation.

Existing Site BL-6428 (Chase Pond)

Location: On Bating Brook about 1800 feet downstream from Pine Street in Douglas, Mass.

Uxbridge, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>10</u>	<u>6</u>	<u>1,550</u>	<u>2.4</u>

Potential for Expansion: Raising the pond level by 15 feet would affect Pine Street. Surface area would more than quadruple.

Remarks: The dam is a stone structure which appears to have collapsed. About 6 feet of water is now being impounded.

Ownership and Use: Ownership was not determined. It appears that the pond is no longer used for any specific purpose.



BL-6423
Rice City Pond



BL-6426
Lee Reservoir



BL-6424



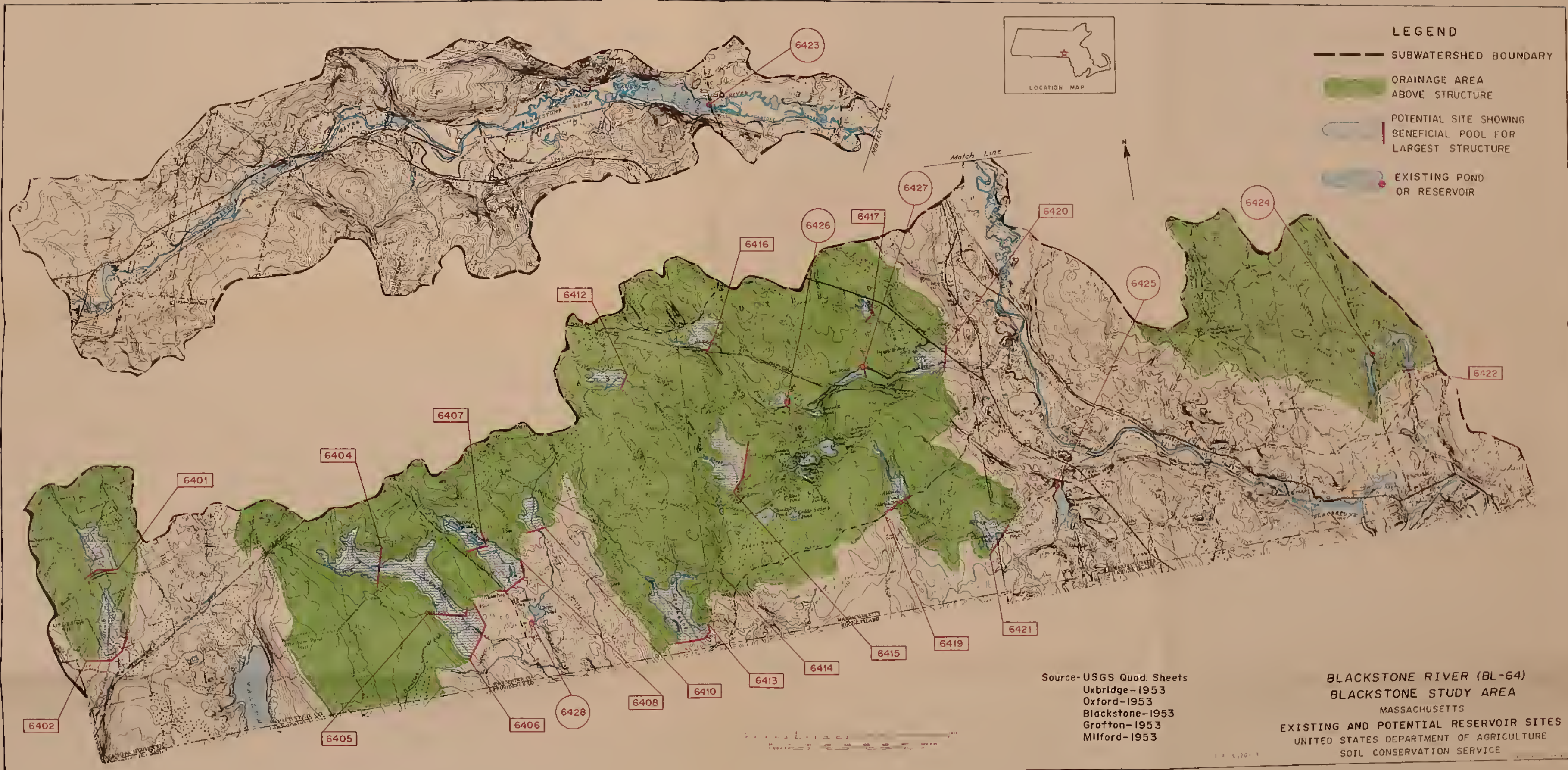
BL-6427
Lee Pond



BL-6425
Ironstone Reservoir

EXISTING RESERVOIRS
SUBWATERSHED BL-64
BLACKSTONE RIVER





BLACKSTONE STUDY AREA
SITE DATA FOR

Subwatershed BL-65, Mumford River

The Mumford River subwatershed covers about 36,400 acres in Douglas, Northbridge, Oxford, Sutton, Uxbridge, and Webster; all in Worcester County.

The subwatershed includes the drainage area of the Mumford River which originates in Sutton, Massachusetts and flows southeasterly to the confluence with the Blackstone in Uxbridge, Massachusetts.

Geology of the potential reservoir sites is characterized by 5 to 20 feet of glacial drift or outwash sand and gravel underlain by granite or schist bedrock.

Twenty potential reservoir sites and 23 existing reservoirs were studied.

POTENTIAL SITE BL-6502

Location: On an unnamed tributary to Carpenter Reservoir about 3,300 feet upstream from Carpenter Road in Northbridge, Mass.

Grafton, Mass. USGS quadrangle

Latitude: 42°08'23"

Longitude: 71°40'58"

Facilities	Facility	Elevation
Affected:	Hill Street	405
	Hartford Turnpike	405
	Lincoln Road	405

Geologic Conditions: Both abutments are granitic gneiss. Depth to granitic gneiss bedrock in the foundation is estimated to be from 5 to 10 feet. Waterholding capabilities appear to be good. Pervious borrow material for dam construction was located near the site; impervious material was not located.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6503

Location: On Purgatory Brook in Sutton State Forest about 600 feet upstream of Whitins Road in Sutton, Mass.

Grafton, Mass. USGS quadrangle

Latitude: 42°07'36"

Longitude: 71°43'17"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	Purgatory Road	545

Geologic Conditions: Both abutments are granitic bedrock. Bedrock outcrops in the foundation. Waterholding capabilities appear to be good. Borrow material for dam construction was not located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

Public Ownership: Most of the dam site and about one-quarter of the potential pool area are within the Sutton State Forest.

POTENTIAL SITE BL-6504

Location: On an unnamed tributary to Dark Brook about 3,600 feet east of Pigeon Hill Cemetery in Sutton, Mass.

Oxford, Mass.-Conn.-Rhode Island USGS quadrangle

Latitude: 42°07'20"

Longitude: 71°45'09"

Facilities Affected: None below elevation 650.

Geologic Conditions: Both abutments are schist bedrock overlain by thin discontinuous englacial drift. Depth to schist bedrock in the foundation is estimated to be from 10 to 15 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was not located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6505

Location: On Dark Brook about 3,000 feet downstream of Mendon Road in Sutton, Mass.

Oxford, Mass.-Conn.-Rhode Island USGS quadrangle

Latitude: 42°07'14" Longitude: 71°45'46"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	Mendon Road	610

Geologic Conditions: Both abutments are englacial drift, shallow to gneiss bedrock. Depth to schist bedrock in the foundation is estimated to be from 10 to 15 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6506

Location: On an unnamed tributary to Manchaug Pond about 200 feet upstream of Manchaug Road in Sutton, Mass.

Oxford, Mass.-Conn.-Rhode Island USGS quadrangle

Latitude: 42°06'54" Longitude: 71°47'26"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	2 Houses	565
	Shed	565
	House	560
	4 Sheds	560
	2 Houses	555
	Central Trunpike	555
	Mendon Road	555
	Old Mill Road	555

Geologic Conditions: The left abutment is englacial drift with schist outcrops high on the slope. The right abutment has swamp deposits at the toe with glacial till high on the slope. Depth to schist bedrock in the foundation is estimated to be from 10 to 15 feet. Waterholding capabilities appear to be fair to good. Previous borrow material for dam construction was located near the site; impervious material was not located.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6507

Location: On Purgatory Brook about 1,250 feet upstream of Route 146 in Sutton, Mass.

Uxbridge, Mass.-Rhode Island USGS quadrangle

Latitude: 42°07'13"

Longitude: 71°42'40"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	Pump House	380
	Reservoir Road	380

Geologic Conditions: The left abutment is outwash sand and gravel at low elevations and englacial drift and granite higher on the slope. The right abutment is granite bedrock overlain by thin discontinuous englacial drift and outwash sand and gravel. Depth to granite bedrock in the foundation is estimated to be from 10 to 15 feet. Waterholding capabilities appear to be poor. Leakage is expected through the right abutment and the foundation. Pervious borrow material for dam construction was located near the site; impervious material was not located.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6508

Location: On Dark Brook about 700 feet upstream of Putnam Hill Road in Sutton, Mass.

Oxford, Mass.-Conn.-Rhode Island USGS quadrangle

* Latitude: 42°06'22"

Longitude: 71°45'20"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	Barn	560
	Putnam Hill Road	470

Geologic Conditions: Both abutments are schist bedrock overlain by thin discontinuous englacial drift. Depth to schist bedrock in the foundation is estimated to be from 5 to 15 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was not located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6509

Location: On an unnamed tributary to Manchaug Pond about 200 feet upstream of Northwest Main Street in Douglas, Mass.
Half of the reservoir area is in Webster, Mass.

Oxford, Mass.-Conn.-R.I. USGS quadrangle

Latitude: 42°05'56: Longitude: 71°47'48"

Facilities Affected: None below elevation 740

Geologic Conditions: Both abutments are dense englacial drift or glacial till, probably shallow to bedrock. Depth to schist bedrock in the foundation is estimated to be from 10 to 15 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6510

Location: On Steamburg Brook about 500 feet upstream of Main Street in Sutton, Mass.

Uxbridge, Mass.-R.I. USGS quadrangle

Latitude: 42°06'06" Longitude: 71°42'29"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	House	410
	Barnett Road	395

Geologic Conditions: The left abutment is outwash sand and gravel. The right abutment is thin discontinuous englacial drift underlain by granite bedrock. Granite outcrops high on the right abutment. Depth to granite bedrock in the foundation is estimated to be from 10 to 20 feet. Waterholding capabilities appear to be poor. Leakage is expected through the left abutment and the foundation. Pervious borrow material for dam construction was located near the site; impervious material was not located.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6511

Location: On an unnamed tributary to Whittin Reservoir about 6,000 feet west of Northwest Main Street and 5,000 feet south of the Sutton-Douglas town line in Douglas, Mass.

Oxford, Mass.-Conn.-R.I. USGS quadrangle

Latitude: 42°04'50" Longitude: 71°48'30"

Facilities Affected: None below elevation 750

Geologic Conditions: Both abutments are grey schist overlain by thin discontinuous glacial drift. Grey schist bedrock outcrops in the foundation. Waterholding capabilities appear to be good. Borrow material for dam construction was not located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6513

Location: On Caswell Brook about 1,400 feet upstream from the confluence with the Mumford River in Douglas, Mass.

Uxbridge, Mass.-R.I. USGS quadrangle

Latitude: 42°05'09" Longitude: 71°43'38"

Facilities Affected: None below elevation 430

Geologic Conditions: Both abutments are thin discontinuous glacial drift, shallow to bedrock, with outcrops of granite high on the slope. Depth to granite bedrock in the foundation is estimated to be from 10 to 20 feet. Waterholding capabilities appear to be good. Previous borrow material for dam construction was located near the site; impervious material was not located.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6514

Location: On an unnamed tributary to Whittin Reservoir about 2,700 feet west of Wallis Street in Douglas, Mass.

Oxford, Mass.-Conn.-R.I. USGS quadrangle

Latitude: 42°04'55" Longitude: 71°46'44"

Facilities Affected: None below elevation 710

Geologic Conditions: Both abutments are granitic gneiss overlain by thin discontinuous glacial drift. Granitic gneiss bedrock outcrops in the foundation. Waterholding capabilities appear to be good. Borrow material for dam construction was not located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

Public Ownership: About three-quarters of the potential pool area is within the Douglas State Forest.

POTENTIAL SITE BL-6515

Location: On an unnamed tributary to Whittin Reservoir about 5,500 feet east of the Webster-Douglas town line in Douglas, Mass.

Oxford, Mass.-Conn.-R.I. USGS quadrangle

Latitude: 42°04'18" Longitude: 71°48'30"

Facilities Affected: None below elevation 750

Geologic Conditions: Both abutments are schist bedrock overlain by thin discontinuous glacial drift. Depth to schist bedrock in the foundation is estimated to be from 5 to 10 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was not located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6516

Location: On Cold Spring Brook about 1,600 feet downstream of Hazel Street in Uxbridge, Mass.

Uxbridge, Mass.-R.I. USGS quadrangle

Latitude: 42°04'59"

Longitude: 71°39'00"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	3 trailers	340
	5 houses	335
	shed	335
	house	330
	house	325
	shed	325
	Route 16	325
	house	320
	shed	320
	4 houses	315
	2 sheds	315
	VFW Hall	315
	Hazel Street	315

Geologic Conditions: Both abutments are thin discontinuous englacial drift underlain by granite bedrock. Granite bedrock outcrops in the foundation. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6517

Location: On an unnamed tributary to Whitin Reservoir about 3,900 feet north of Webster Street in Douglas, Mass.

Oxford, Mass.-Conn.-R.I. USGS quadrangle

Latitude: 42°03'58"

Longitude: 71°47'06"

Facilities Affected: None below elevation 690

POTENTIAL SITE BL-6517 (cont'd)

Geologic Conditions: Both abutments are outwash sand and gravel with dense glacial till high on the slope of the right abutment. Depth to granite bedrock in the foundation is estimated to be from 15 to 20 feet. Waterholding capabilities appear to be poor. Leakage is expected through both abutments. Borrow material for dam construction was located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

Public Ownership: The site is within the Douglas State Forest.

POTENTIAL SITE BL-6518

Location: On Dunleavey Brook about 100 feet upstream of Hartford Avenue in Uxbridge, Mass.

Uxbridge, Mass.-R.I. USGS quadrangle

Latitude: 42°04'28" Longitude: 71°41'22"

Facilities Affected: None below elevation 390

Geologic Conditions: Both abutments are dense glacial till at high elevations and outwash sand and gravel at the toe of the slopes. Depth to granite bedrock in the foundation is estimated to be from 20 to 25 feet. Waterholding capabilities appear to be fair to good. Leakage is expected through both abutments and the foundation. Borrow material for dam construction was located near the site.

Engineering Notes: Neither abutment is recommended for the excavated emergency spillway location. A concrete emergency spillway may be needed at this site.

POTENTIAL SITE BL-6519

Location: On Wellman Brook about 1,600 feet upstream from the confluence with the Mumford River in Douglas, Mass.

Uxbridge, Mass.-R.I. USGS quadrangle

Latitude: 42°04'22"

Longitude: 71°42'11"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	House	395
	House	385
	House	380
	House	375
	House	370
	Shed	370
	Route 116	370

Geologic Conditions: The left abutment is dense glacial till. The right abutment is outwash sand and gravel. Depth to granite bedrock in the foundation is estimated to be from 20 to 30 feet. Water-holding capabilities appear to be poor. Leakage is expected through the right abutment. Borrow material for dam construction was located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6520

Location: On Riddle Brook about 1,100 feet upstream of West Street in Douglas, Mass.

Uxbridge, Mass.-R.I. USGS quadrangle

Latitude: 42°04'02"

Longitude: 71°43'29"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	House	435
	Garage	435
	4 Houses	430
	House	415
	Fuel pipeline	410
	Main Street	410

Geologic Conditions: Both abutments are outwash sand and gravel. Depth to bedrock in the foundation is estimated to be from 50 to 60 feet. Water-holding capabilities appear to be poor. Leakage is expected through both abutments and the foundation. Previous borrow material for dam construction was located near the site; impervious material was not located.

POTENTIAL SITE BL-6520 (cont'd)

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6522

Location: On Southwick Brook about 500 feet upstream of Maple Street in Douglas, Mass.

Uxbridge, Mass.-R.I. USGS quadrangle

Latitude: 42°03'32" Longitude: 71°42'39"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	House	545
	Road	520

Geologic Conditions: Both abutments are outwash sand and gravel. Depth to granite bedrock in the foundation is estimated to be from 20 to 25 feet. Waterholding capabilities appear to be poor. Leakage is expected through both abutments. Pervious borrow material for dam construction was located near the site; impervious material was not located.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6523

Location: On Gilboa Brook about 1,900 feet upstream from the confluence with the Mumford River in Douglas, Mass.

Uxbridge, Mass.-R.I. USGS quadrangle

Latitude: 42°05'12" Longitude: 71°42'06"

Facilities Affected: None below elevation 390

Geologic Conditions: Both abutments are outwash sand and gravel, with a predominance of sand, gravel, and boulders. Depth to bedrock in the foundation is estimated to be less than 10 feet. Waterholding capabilities appear to be poor. Leakage is expected through both abutments and the foundation. Pervious borrow material for dam construction was located near the site; impervious material was not located.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

STUDY AREA-BLACKSTONE RIVER	SUBWATERSHED MUMFORD RIVER
BENEFICIAL POOL	EMERGENCY SPILLWAY
	DAM
	SAFE

ELEV STORAGE COST PER AREA SURF AC DAM TYPE CREST STORAGE AT CREST COST PER AC FT * HIGH WATER * YIELD
(MSL) AC FT IN (\$) (AC) (\$) (FT) (MSL) AC FT IN (\$) (MSL) (AC) (MSL) FT CY * PERCENT CHANCE

DA= 4.70 SQ MI = 3008 AC USGS QUAD- GRAFTON LATITUDE 42-08-23 LONGITUDE 71-40-58
STREAM WATER QUALITY (B) 100-YR PRIN SPWY DESIGN STORM RUNOFF = 7.20 IN, PEAK FLOW = 1936 CFS

[illegible][illegible]

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*****
IITE-BL-6504
SITE RATING (1)
DA= 0.60 SQ MI = 384 AC
STREAM WATER QUALITY (B)
USGS QUAD- OXFORD
100-YR PRIN SPWY DESIGN STORM
LATITUDE 42-07-20 LONGITUDE 71-45-09
RUNOFF = 7.20 IN, PEAK FLOW = 247 CFS
*****
542.0 850 13.2 1830 42 37380 76.0 * 542.0 N 860 13.3 5070 28 * 542.0 70 0.49
552.5 1450 22.7 1330 76 25460 86.5 * 555.0 E 1654 25.7 1170 * 557.2 97 * 560.2 94 * 0.97
*****

```

	0	0.0	4	2.9	*	629.4	E	133	4.1	1980	*	632.7	30	*	636.9	19	*	26	*****
620.9																			
628.3	100	3.0	24	10.3	*	630.8	E	171	5.3	1950	*	634.8	32	*	638.9	21	*	32	0.18
634.8	289	9.0	32	16.7	*	637.3	E	376	11.8	1220	*	640.9	37	*	644.5	27	*	55	0.32
640.4	478	14.8	36	22.4	*	642.9	E	581	18.1	1020	*	645.9	47	*	649.3	31	*	82	0.41
642.5	561	17.5	40	24.5	*	645.0	E	672	21.0	1020	*	647.0	49	*	650.0	32	*	87	0.43
					*						*								*

NOTES - (1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.
(2) EMERGENCY SPILLWAY STORAGE AND COSTS ARE BASED ON TOTAL STORAGE, INCLUDING BENEFICIAL POOL.
(3) EMERGENCY SPILLWAY TYPE CODE- C=CONCRETE CHUTE, D=CONCRETE DROP, E=EXCAVATED, T= TWO SPILLWAYS, N= NONE
(4) TABULAR DATA ARE BASED ON PRELIMINARY INFORMATION. FIGURES SHOWN ARE PRIMARILY FOR COMPARISON PURPOSES.
(5) ELEVATIONS ARE SHOWN TO THE NEAREST 0.1 FOOT TO SHOW VARIATION BETWEEN DEVELOPMENTS ONLY, AND ARE NOT TO BE CONSIDERED ACCURATE TO THAT DEGREE.

** DO NOT USE FOR FINAL SITE SELECTION OR LAND ACQUISITION. **

SUMMARY DATA FOR POTENTIAL UPSTREAM RESERVOIR SITES

STUDY AREA-BLACKSTONE RIVER										SUBWATERSHED MUMFORD RIVER									
BENEFICIAL POOL										EMERGENCY SPILLWAY									
ELEV	STORAGE	AC FT	AREA	COST/ SURF AC	DEPTH AT DAM	CREST ELEV	STORAGE AT CREST	COST PER AC FT		DESIGN	HIGH WATER	DAM	SAFE	YIELD					
(MSL)	AC FT	IN	(AC)	(\$)	(FT)	(MSL)	AC FT	IN	(\$)	(MSL)	(AC)	(MSL)	FT	CY	(MGD)				
SITE-BL-6505										LATITUDE 42-07-14 LONGITUDE 71-45-46									
DA= 0.70 SQ MI = 448 AC										RUNOFF = 7.20 IN, PEAK FLOW = 288 CFS									
SITE RATING (1)																			
577.5	0	0.0	2	15830	5.6	591.3	E 155	4.1	1510	595.3	28	600.0	28	24	0.18				
588.9	100	2.7	18	12840	16.9	591.4	E 158	4.1	1840	596.5	30	601.0	29	27	0.31				
594.9	239	6.4	27	12500	22.9	597.4	E 318	8.5	1110	601.7	37	606.0	34	41	0.46				
603.3	517	13.7	39	13130	31.2	605.8	E 624	16.7	780	609.2	47	613.0	41	73	0.55				
609.7	794	21.2	47	13220	37.7	612.2	E 928	24.7	670	615.0	58	618.7	47	107	0.58				
612.4	933	25.0	53		40.4	614.9	E 1075	28.7	650	617.0	62	620.0	48	119	0.61				
SITE-BL-6506										LATITUDE 42-06-54 LONGITUDE 71-47-26									
DA= 0.80 SQ MI = 512 AC										RUNOFF = 7.20 IN, PEAK FLOW = 330 CFS									
SITE RATING (2)																			
543.5	0	0.0	6	24360	1.6	551.9	E 177	4.1	2840	555.0	51	559.0	17	80	0.20				
549.7	100	2.3	27	18630	7.6	552.2	E 189	4.4	3520	556.2	56	559.8	18	88	0.35				
554.0	261	6.1	46	15960	12.1	556.5	E 398	9.3	2170	559.5	70	562.9	21	124	0.52				
559.5	583	13.7	71	13300	17.6	562.0	E 795	18.6	1420	563.5	106	566.5	25	177	0.61				
562.5	828	19.4	96		20.5	565.0	E 1102	25.7	1150	565.8	126	568.8	27	213	0.61				
SITE-BL-6507										LATITUDE 42-07-13 LONGITUDE 71-42-40									
DA= 2.90 SQ MI = 1856 AC										RUNOFF = 7.20 IN, PEAK FLOW = 1195 CFS									
SITE RATING (3)																			
379.1	100	0.6	19	43010	21.1	379.1	T 123	0.8	6510	394.1	36	398.5	41	117	0.31				
382.6	175	1.1	23	34870	24.6	382.6	T 199	1.2	4100	395.6	38	398.6	41	117	0.45				
388.2	326	2.0	30	29930	30.2	388.2	T 349	2.3	2580	397.2	39	400.2	42	132	0.68				
392.5	462	3.0	35	28800	34.5	392.5	T 485	3.0	2060	397.9	40	400.9	43	146	0.83				

NOTES - (1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.
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 (3) EMERGENCY SPILLWAY TYPE CODE- C=CONCRETE CHUTE, D=CONCRETE DROP, E=EXCAVATED, T= TWO SPILLWAYS, N= NONE
 (4) TABULAR DATA ARE BASED ON PRELIMINARY INFORMATION. FIGURES SHOWN ARE PRIMARILY FOR COMPARISON PURPOSES.
 (5) ELEVATIONS ARE SHOWN TO THE NEAREST 0.1 FOOT TO SHOW VARIATION BETWEEN DEVELOPMENTS ONLY, AND ARE NOT TO BE CONSIDERED ACCURATE TO THAT DEGREE.

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SUMMARY DATA FOR POTENTIAL UPSTREAM RESERVOIR SITES

STUDY AREA-BLACKSTONE RIVER										SUBWATERSHED MUMFORD RIVER									
BENEFICIAL POOL										EMERGENCY SPILLWAY									
ELEV	STORAGE	COST PER AC FT	AREA (AC)	COST SURF AC (\$)	DEPTH AT DAM (FT)	CREST ELEV (MSL)	STORAGE AT CREST	COST PER AC FT	DESIGN HIGH WATER	DAM	SAFE YIELD	AT 95	FILL VOL (1000 CY)	PERCENT CHANCE	TOP ELEV	HGT	AREA (AC)	DESIGN HIGH WATER	DAM
(MSL)	AC FT IN	(\$)	(AC)	(\$)	(FT)	TYPE	AC FT IN	(\$)	(\$)	FT	YIELD	AT 95	FILL VOL (1000 CY)	PERCENT CHANCE	TOP ELEV	HGT	AREA (AC)	DESIGN HIGH WATER	DAM
SITE-BL-6511										SITE-BL-6513									
DA= 0.90 SQ MI = 576 AC										DA= 0.90 SQ MI = 576 AC									
STREAM WATER QUALITY (B)										STREAM WATER QUALITY (B)									
SITE RATING (1)	0	0.0	2	35520	20.5	6.6	199	4.1	2760	732.9	E	199	4.1	2760	732.9	E	199	4.1	2760
714.5	100	2.0	18	35520	20.5	6.6	199	4.1	2760	732.9	E	199	4.1	2760	732.9	E	199	4.1	2760
728.5	100	2.0	18	35520	20.5	6.6	199	4.1	2760	732.9	E	199	4.1	2760	732.9	E	199	4.1	2760
732.7	186	3.9	23	31320	24.7	7.3	254	5.3	2850	735.2	E	254	5.3	2850	735.2	E	254	5.3	2850
739.2	359	7.5	30	29590	31.2	7.4	459	9.6	1950	741.7	E	459	9.6	1950	741.7	E	459	9.6	1950
742.5	485	10.1	46	22450	34.5	7.4	626	13.0	1650	745.0	E	626	13.0	1650	745.0	E	626	13.0	1650
LATITUDE 42-04-50										LATITUDE 42-05-09									
LONGITUDE 71-48-30										LONGITUDE 71-43-38									
RUNOFF = 7.20 IN, PEAK FLOW = 371 CFS										RUNOFF = 7.20 IN, PEAK FLOW = 371 CFS									
SITE-BL-6514										SITE-BL-6514									
DA= 2.70 SQ MI = 1728 AC										DA= 2.70 SQ MI = 1728 AC									
STREAM WATER QUALITY (B)										STREAM WATER QUALITY (B)									
SITE RATING (1)	0	0.0	7	7220	10.1	1.2	199	4.1	880	410.7	E	199	4.1	880	410.7	E	199	4.1	880
403.2	100	2.0	33	7220	10.1	1.2	199	4.1	880	410.7	E	199	4.1	880	410.7	E	199	4.1	880
408.4	100	2.0	33	7220	10.1	1.2	199	4.1	880	410.7	E	199	4.1	880	410.7	E	199	4.1	880
412.0	253	5.3	46	6270	16.0	1.2	204	4.3	1170	410.9	E	204	4.3	1170	410.9	E	204	4.3	1170
418.0	558	11.6	58	6280	16.0	1.2	381	7.8	760	414.5	E	381	7.8	760	414.5	E	381	7.8	760
422.5	840	17.5	67	6910	20.5	1.2	717	14.8	510	420.5	E	717	14.8	510	420.5	E	717	14.8	510
LATITUDE 42-04-55										LATITUDE 42-04-55									
LONGITUDE 71-46-44										LONGITUDE 71-46-44									
RUNOFF = 7.20 IN, PEAK FLOW = 1048 CFS										RUNOFF = 7.20 IN, PEAK FLOW = 1048 CFS									
SITE-BL-6514										SITE-BL-6514									
DA= 2.70 SQ MI = 1728 AC										DA= 2.70 SQ MI = 1728 AC									
STREAM WATER QUALITY (B)										STREAM WATER QUALITY (B)									
SITE RATING (1)	0	0.0	3	62570	35.2	19.5	598	4.1	1620	663.3	E	598	4.1	1620	663.3	E	598	4.1	1620
629.5	100	0.7	11	62570	35.2	19.5	598	4.1	1620	663.3	E	598	4.1	1620	663.3	E	598	4.1	1620
645.2	100	0.7	11	62570	35.2	19.5	598	4.1	1620	663.3	E	598	4.1	1620	663.3	E	598	4.1	1620
665.7	683	4.6	50	24130	55.6	35.2	705	4.9	1720	665.7	N	705	4.9	1720	665.7	N	705	4.9	1720
682.8	1850	12.8	88	20100	72.8	72.8	1872	13.0	940	682.8	N	1872	13.0	940	682.8	N	1872	13.0	940
697.8	3600	25.0	148	15160	87.8	87.8	4004	27.7	560	700.3	E	4004	27.7	560	700.3	E	4004	27.7	560

NOTES -

(1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.

(2) EMERGENCY SPILLWAY STORAGE AND COSTS ARE BASED ON TOTAL STORAGE, INCLUDING BENEFICIAL POOL.

(3) EMERGENCY SPILLWAY TYPE CODE- C=CONCRETE CHUTE, D=CONCRETE DROP, E=EXCAVATED, T= TWO SPILLWAYS, N= NONE

(4) TABULAR DATA ARE BASED ON PRELIMINARY INFORMATION. FIGURES SHOWN ARE PRIMARILY FOR COMPARISON PURPOSES.

(5) ELEVATIONS ARE SHOWN TO THE NEAREST 0.1 FOOT TO SHOW VARIATION BETWEEN DEVELOPMENTS ONLY, AND ARE NOT TO BE CONSIDERED ACCURATE TO THAT DEGREE.

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SUMMARY DATA FOR POTENTIAL UPSTREAM RESERVOIR SITES

STUDY AREA-BLACKSTONE RIVER										SUBWATERSHED MUMFORD RIVER									
BENEFICIAL POOL										EMERGENCY SPILLWAY									
ELEV	STORAGE	AC FT	IN	COST/	DEPTH	CREST	STORAGE	COST	DESIGN	DESIGN	DESIGN	DESIGN	DESIGN	DESIGN	DESIGN	DESIGN	DESIGN	DESIGN	DESIGN
(MSL)	AC FT	IN	(\$)	AC	(FT)	(MSL)	AT CREST	PER	AC FT	AC FT	AC FT	AC FT	AC FT	AC FT	AC FT	AC FT	AC FT	AC FT	AC FT
DA= 0.50 SQ MI = 320 AC										USGS QUAD- OXFORD									
STREAM WATER QUALITY (B)										100-YR PRIN SPWY DESIGN STORM									
SITE-BL-6515										LATITUDE 42-04-18 LONGITUDE 71-48-30									
SITE RATING (1)										RUNOFF = 7.20 IN, PEAK FLOW = 206 CFS									
696.5	0	0.0	2	3700	4.6	712.3	E	111	4.1	2460	716.0	17	720.4	28	37	37	37	37	37
711.8	100	3.8	13	28850	19.7	714.3	E	138	5.1	2690	718.8	20	722.9	31	46	46	46	46	46
717.8	194	7.3	19	25410	25.7	720.3	E	249	9.3	1940	724.3	25	728.0	36	69	69	69	69	69
726.2	383	14.3	26	25200	34.2	728.7	E	455	17.1	1450	732.0	31	735.5	44	112	112	112	112	112
732.7	572	21.5	31	26460	40.7	735.2	E	655	24.6	1270	738.0	35	741.4	49	156	156	156	156	156
735.5	667	25.0	34	27000	43.5	738.0	E	757	28.4	1200	740.8	39	744.0	52	179	179	179	179	179
SITE-BL-6516										USGS QUAD- UXBRIDGE									
DA= 2.40 SQ MI = 1536 AC										LATITUDE 42-04-59 LONGITUDE 71-39-00									
STREAM WATER QUALITY (B)										100-YR PRIN SPWY DESIGN STORM									
SITE RATING (1)										RUNOFF = 7.20 IN, PEAK FLOW = 989 CFS									
300.7	0	0.0	4	18040	8.7	320.5	E	531	4.1	3050	326.0	97	333.1	41	106	106	106	106	106
310.7	100	0.8	17	105420	18.7	310.7	N	119	0.8	15140	327.1	104	337.6	46	155	155	155	155	155
321.7	617	4.8	74	28950	29.7	321.7	N	636	5.0	3390	332.0	127	341.5	49	213	213	213	213	213
332.0	1650	12.8	127	20440	40.0	334.5	E	1991	15.6	1300	339.1	153	344.9	53	271	271	271	271	271
342.5	3189	24.9	168	21140	50.5	342.5	T	3208	25.1	1100	347.2	189	350.2	58	391	391	391	391	391
SITE-BL-6517										USGS QUAD- OXFORD									
DA= 2.00 SQ MI = 1280 AC										LATITUDE 42-03-58 LONGITUDE 71-47-06									
STREAM WATER QUALITY (B)										100-YR PRIN SPWY DESIGN STORM									
SITE RATING (3)										RUNOFF = 7.20 IN, PEAK FLOW = 824 CFS									
632.7	0	0.0	5	4480	4.6	652.9	E	443	4.1	930	655.4	47	658.4	30	57	57	57	57	57
642.0	100	0.8	17	25770	14.1	652.5	E	427	4.0	1050	655.0	46	658.0	30	55	55	55	55	55
655.4	528	4.9	47	15730	27.4	659.9	E	772	7.1	950	662.3	63	665.3	37	91	91	91	91	91
669.0	1383	13.0	79	15680	41.0	671.5	E	1608	15.1	770	674.0	89	677.0	49	181	181	181	181	181
682.8	2667	25.0	113	17710	54.8	685.3	E	2975	27.9	670	687.5	135	690.5	63	348	348	348	348	348

NOTES - (1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.

(2) EMERGENCY SPILLWAY STORAGE AND COSTS ARE BASED ON TOTAL STORAGE, INCLUDING BENEFICIAL POOL.

(3) EMERGENCY SPILLWAY TYPE CODE- C=CONCRETE CHUTE, D=CONCRETE DROP, E=EXCAVATED, T= TWO SPILLWAYS, N= NONE

(4) TABULAR DATA ARE BASED ON PRELIMINARY INFORMATION. FIGURES SHOWN ARE PRIMARILY FOR COMPARISON PURPOSES.

(5) ELEVATIONS ARE SHOWN TO THE NEAREST 0.1 FOOT TO SHOW VARIATION BETWEEN DEVELOPMENTS ONLY, AND ARE NOT TO BE CONSIDERED ACCURATE TO THAT DEGREE.

** DO NOT USE FOR FINAL SITE SELECTION OR LAND ACQUISITION. **

STUDY AREA-BLACKSTONE RIVER															SUBWATERSHED MUMFORD RIVER																													
BENEFICIAL POOL															EMERGENCY SPILLWAY																													
* * * * *															* * * * *																													
STORAGE					COST					DEPTH					CREST					STORAGE					COST					DESIGN					DAM					SAFE				
ELEV	STORAGE	PER	AREA	COST/	AT	DEPTH	CREST	STORAGE	AT	CREST	PER	ELEV	AREA	TOP	FILL	PERCENT																												
(MSL)	AC FT	IN	(AC)	(\$)	(FT)	(FT)	(MSL)	AC FT	IN	(MSL)	AC FT	TYPE	ELEV	AREA	ELEV	HGT	CHANCE																											
* * * * *															* * * * *																													
DA= 0.60 SQ MI = 384 AC															USGS QUAD- UXBRIDGE																													
STREAM WATER QUALITY (B)															100-YR PRIN SPWY DESIGN STORM																													
RUNOFF = 7.20 IN, PEAK FLOW = 247 CFS															LATITUDE 42-04-28 LONGITUDE 71-41-22																													
SITE-BL-6518															SITE-BL-6519																													
SITING (2)															SITING (3)																													
318.2	0	0.0	2	7180	11	67860	21.0	335.0	E	105	3.3	6850	341.7	15	347.1	33	58																											
335.0	100	3.0	17	54790	29.7	343.7	E	221	6.8	4090	349.7	21	360.7	47	144	0.28																												
343.7	217	6.8	23	47680	41.2	355.2	N	455	14.2	2460	363.4	28	370.2	56	234	0.40																												
355.2	450	14.1	29	48570	50.2	364.2	N	688	21.5	2030	371.7	34	378.7	65	343	0.47																												
364.2	683	21.4	32	48200	54.0	368.0	N	805	25.2	1890	375.2	36	382.2	68	398	0.50																												
368.0	800	25.0	* * * * *																																									
DA= 0.70 SQ MI = 448 AC <th colspan="15">LATITUDE 42-04-22 LONGITUDE 71-42-11</th>															LATITUDE 42-04-22 LONGITUDE 71-42-11																													
STREAM WATER QUALITY (B) <th colspan="15">100-YR PRIN SPWY DESIGN STORM</th>															100-YR PRIN SPWY DESIGN STORM																													
RUNOFF = 7.20 IN, PEAK FLOW = 288 CFS <th colspan="15">LATITUDE 42-04-22 LONGITUDE 71-42-11</th>															LATITUDE 42-04-22 LONGITUDE 71-42-11																													
SITE-BL-6519 <td colspan="15">* * * * *</td>															* * * * *																													
SITING (3)															SITING (3)																													
353.5	0	0.0	2	11400	12	96330	26.5	377.1	E	136	3.5	8380	380.6	20	383.6	36	83																											
374.6	100	2.7	22	60670	34.7	385.2	E	299	8.0	4420	387.5	26	390.5	43	122	0.31																												
382.7	239	6.4	32	50260	45.2	395.7	E	603	16.1	2640	398.1	37	401.1	53	201	0.46																												
393.2	517	13.7	40	45240	53.0	403.5	E	904	24.2	2000	405.9	46	408.9	61	278	0.55																												
401.0	794	21.2	44	43710	56.4	406.9	E	1054	28.2	1830	409.2	50	412.2	64	315	0.58																												
404.4	933	25.0	* * * * *																																									
DA= 3.80 SQ MI = 2432 AC <th colspan="15">LATITUDE 42-04-02 LONGITUDE 71-43-29</th>															LATITUDE 42-04-02 LONGITUDE 71-43-29																													
STREAM WATER QUALITY (B) <th colspan="15">100-YR PRIN SPWY DESIGN STORM</th>															100-YR PRIN SPWY DESIGN STORM																													
RUNOFF = 7.20 IN, PEAK FLOW = 1566 CFS <th colspan="15">LATITUDE 42-04-02 LONGITUDE 71-43-29</th>															LATITUDE 42-04-02 LONGITUDE 71-43-29																													
SITE-BL-6520 <td colspan="15">* * * * *</td>															* * * * *																													
SITING (3)															SITING (3)																													
405.9	0	0.0	9	129280	15.2	413.2	T	130	0.6	18810	428.2	44	434.5	37	94	0.34																												
413.2	100	0.5	33	81890	24.1	422.0	T	359	1.7	7550	435.0	52	439.2	41	124	0.75																												
422.0	329	1.6	50	67530	35.0	433.0	T	816	4.0	4120	445.2	68	449.7	52	219	1.28																												
433.0	786	3.9	60	60900	43.4	441.4	T	1273	6.3	2860	447.2	72	450.2	52	229	1.64																												
441.4	1243	6.1	62	59220	44.5	442.5	T	1341	6.6	2740	447.5	72	450.5	52	233	1.70																												
442.5	1311	6.5	* * * * *																																									

NOTES - (1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.

- (2) EMERGENCY SPILLWAY STORAGE AND COSTS ARE BASED ON TOTAL STORAGE, INCLUDING BENEFICIAL POOL.
- (3) EMERGENCY SPILLWAY TYPE CODE- C=CONCRETE CHUTE, D=CONCRETE DROP, E=EXCAVATED, T= TWO SPILLWAYS, N= NONE
- (4) TABULAR DATA ARE BASED ON PRELIMINARY INFORMATION. FIGURES SHOWN ARE PRIMARILY FOR COMPARISON PURPOSES.
- (5) ELEVATIONS ARE SHOWN TO THE NEAREST 0.1 FOOT TO SHOW VARIATION BETWEEN DEVELOPMENTS ONLY, AND ARE NOT TO BE CONSIDERED ACCURATE TO THAT DEGREE.

*** DO NOT USE FOR FINAL SITE SELECTION OR LAND ACQUISITION. ***

Existing Site BL-6524(Carpenter Reservoir)

Location: On tributary to the Mumford River about 1800 feet upstream from Purgatory Road and Whitins Pond in Northbridge, Mass.

Grafton and Uxbridge, Mass. USGS quadrangles

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>85</u>	<u>35</u>	<u>2,650</u>	<u>4.1</u>

Potential for Expansion: Raising the reservoir level by 30 feet would affect Carpenter Road. Surface area would be nearly tripled.

Remarks: The dam is an earthfill structure with riprap on the upstream slope. There is also a long earthfill dike on the left abutment. The spillway is a concrete and stone weir about 50 feet long and 6 feet deep. Seepage was observed at the downstream slope of the dike. There was also some leakage through the sidewall of the spillway.

Ownership and Use: The reservoir is owned by the Whitinsville Water Department and is used as a water supply.

Existing Site BL-6525(Swans Pond)

Location: On an unnamed tributary to the Mumford River about 1200 feet upstream from Carr Road in Sutton, Mass.

Uxbridge, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>35</u>	<u>10</u>	<u>1,850</u>	<u>2.9</u>

Potential for Expansion: Raising the pond level 15 feet would affect Route 146. Surface area would be about doubled.

Remarks: The dam is an earthfill structure with vertical stone faces. The spillway on the left abutment has washed out and water is flowing over the stone rubble. Dam and spillway are in poor condition.

Ownership and Use: The pond is owned by Richard and Ruth Hare. The dam has been breached and the pond is no longer used.

Existing Site BL-6526(Fish Pond)

Location: On a tributary to Whitins Pond about 100 feet upstream from Purgatory Road in Northbridge, Mass.

Uxbridge, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>10</u>	<u>6</u>	<u>2,800</u>	<u>4.4</u>

Potential for Expansion: Topography limits any significant increase in surface area. Carpenter Reservoir (site BL-6524) is located immediately upstream.

Remarks: The dam is an earthfill structure with vertical stone faces. The principal spillway is a weir about 50 feet long and 3 feet deep. There is also a 12 foot wide concrete chute adjacent to the principal spillway. The dam and spillways are in good condition.

Ownership
and
Use:

Existing Site BL-6527(Meadow Pond)

Location: On the Mumford River in the Whitinsville section of Northbridge, Mass.

Uxbridge, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>160</u>	<u>20</u>	<u>7,200</u>	<u>11.3</u>

Potential for Expansion: Factories and housing developments surrounding the Pond limit expansion.

Remarks: The dam is an earthfill structure with riprap on the upstream slope. The vertical downstream face is constructed of granite blocks. The principal spillway is a timber weir about 100 feet long and 6 feet deep. Water falls about 5 feet to a riprapped channel. The dam and spillway are in good condition. This structure also controls the water level in Whitins Pond through culverts under Main Street.

Ownership and Use: The pond is owned by Whitinsville Machine Works and is used as a storage reservoir.

Existing Site BL-6528(Lackey Pond)

Location: On the Mumford River at Lackey Dam Road in Sutton, Mass.
Two-thirds of the reservoir area is in Uxbridge, Mass.

Uxbridge, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>115</u>	<u>15</u>	<u>21,900</u>	<u>34.2</u>

Potential for Expansion: Raising the pond level by 10 feet would affect Lackey Dam Road, Route 146, and 5 houses. Surface area would be nearly doubled.

Remarks: The dam is an earthfill structure with vertical granite walls upstream and downstream. The principal spillway is a timber weir about 50 feet long and 10 feet deep. Water falls about 5 feet to 3 stone arches under Lackey Road. The dam and spillway are in good condition.

Ownership and Use: The pond is owned by Whitinsville Machine Works, Inc. and is used as a storage reservoir.

Existing Site BL-6529(Linwood Pond)

Location: On the Mumford River about 400 feet upstream from the Uxbridge-Northbridge town line in Northbridge, Mass.

Uxbridge, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>55</u>	<u>12</u>	<u>31,300</u>	<u>48.9</u>

Potential for Expansion: Limited. A railroad and upstream development would be affected.

Remarks: The dam is an earthfill structure with granite masonry on the upstream side. The principal spillway is a weir constructed of 12"x12" timber beams. The weir is about 100 feet long and 4 feet deep. Water drops about 4 feet to a riprapped channel. There is also a gate-controlled spillway on the left abutment for the head race canal of an old mill. There is some erosion on the upstream face of the dam.

Ownership and Use: The pond is owned by Stylon Corporation and is used as a storage reservoir.

Existing Site BL-6530(Whitin Pond)

Location: On the Mumford River about 1400 feet downstream from the Penn-Central Railroad in Uxbridge, Mass.

Uxbridge, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>30</u>	<u>12</u>	<u>31,800</u>	<u>49.7</u>

Potential for Expansion: Streets and houses surrounding the pond and a railroad limit the expansion.

Remarks: The dam is an earthfill structure with a vertical granite block wall on the upstream face. The principal spillway is a weir constructed of 12"x12" timber beams. The weir is about 100 feet long and 6 feet deep. Water drops about 3 feet to a riprapped channel. There are flashboard-controlled spillways on both abutments. Both spillways are constructed of granite blocks and are about 12 feet wide and 4 feet deep. The dam and spillways are in good condition.

Ownership and Use: The pond is owned by Gray Rock Inn and is used for recreation.

Existing Site BL-6531(Caprone Pond)

Location: On the Mumford River about 100 feet upstream from Route 16 in Uxbridge, Mass.

Uxbridge, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>30</u>	<u>15</u>	<u>34,600</u>	<u>54.1</u>

Potential for Expansion: A housing development and the Penn-Central Railroad would be affected by expansion. }

Remarks: The dam is an earthfill structure with vertical granite block walls. The spillway is a granite masonry weir about 75 feet long and 4 feet deep. There is a gate-controlled spillway on the right abutment which outlets into 2 bays each 3 feet wide and 3 feet deep. There is also a flashboard-controlled spillway on the left abutment which is about 20 feet wide and 4 feet deep. The dam and spillways are in good condition.

Ownership and Use: The pond is owned by Emil Bernart & Sons, Inc. and is used as a storage reservoir.

Existing Site BL-6532(Rivulet Pond)

Location: On Cold Spring Brook about 150 feet upstream from Rivulet Street in Uxbridge, Mass.

Uxbridge, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>10</u>	<u>10</u>	<u>2,300</u>	<u>3.6</u>

Potential for Expansion: Streets and houses on the left shore limit expansion. An excessively long dam would be needed.

Remarks: The dam is an earthfill structure. The principal spillway is a granite masonry weir about 50 feet long and 4 feet deep. A mill is located at the downstream side of the dam. There is also a gate-controlled spillway on the left abutment which controls flow to the mill head race.

Ownership and Use: The pond is owned by Nelmor Co., Inc. and is used as a storage reservoir for industrial use.

Existing Site BL-6533(Gilboa Pond)

Location: On the Mumford River near the Uxbridge-Douglas town line in Douglas, Mass.

Uxbridge, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>25</u>	<u>15</u>	<u>19,950</u>	<u>31.2</u>

Potential for Expansion: Limited. A factory, Gilboa Street, and about 10 houses would be affected.

Remarks: The dam is an earthfill structure. The principal spillway is a wood weir about 100 feet long and 3 feet deep. There is also a gate-controlled spillway on the left abutment. Large trees are growing on the dam. Concrete in the principal spillway sidewalls is cracked and broken. Some seepage was observed near the left abutment.

Ownership and Use: The pond is owned by Schusters Mills and is used as a storage reservoir.

Existing Site BL-6534(Reservoir #4)

Location: On Cook Allen Brook about 2800 feet upstream from Route 146 in Sutton, Mass.

Uxbridge, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>10</u>	<u>30</u>	<u>800</u>	<u>1.3</u>

Potential for Expansion: Raising the reservoir level by 50 feet would affect Mendon Road. Surface area would be nearly quadrupled. Two water supply reservoirs are located upstream. Yield of the three reservoir system needs to be considered in any expansion of this site.

Remarks: The dam is an earthfill structure with riprap on the upstream slope. The spillway is a stone masonry channel about 20 feet wide and 4 feet deep. There is also a gate-controlled pipe spillway. The dam and spillways are in good condition.

Ownership and Use: The reservoir is owned by Whitinsville Water Company and is used as a water supply.

Existing Site BL-6535(Hunt Pond)

Location: On Southwick Brook about 300 feet upstream from Route 16 in Douglas, Mass.

Uxbridge, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>3</u>	<u>12</u>	<u>600</u>	<u>0.9</u>

Potential for Expansion: Topography limits any significant increase in surface area. Streets and houses surrounding the pond limit expansion.

Remarks: The dam is an earthfill structure with vertical stone masonry on the downstream face. There is also an earthfill dike on the right abutment. The spillway is a masonry weir about 20 feet long and 1 foot deep. Large trees are growing on the dike.

Ownership and Use:

Existing Site BL-6536(Dudley Pond)

Location: On Dudley Brook about 100 feet upstream from Southeast Main Street in Douglas, Mass.

Uxbridge, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>10</u>	<u>6</u>	<u>900</u>	<u>1.4</u>

Potential for Expansion: The pond is surrounded by streets, houses, and a railroad which limit expansion.

Remarks: The dam is an earthfill structure with a vertical stone wall on the downstream face. The spillway on the right abutment is a gate-controlled fieldstone conduit about 4 feet wide by 4 feet deep. The spillway on the left abutment is a concrete chute about 6 feet wide and 2.5 feet deep. Large trees are growing near the base of the dam. Tree roots are exposed all along the earthfill. Seepage is visible at the downstream toe of the dam.

Ownership and Use: The pond is owned by the Douglas Fish and Game Club and is used for recreation.

Existing Site BL-6537(Morse Pond)

Location: On Centerville Brook about 700 feet upstream from the Penn-Central Railroad in Douglas, Mass.

Uxbridge, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>30</u>	<u>10</u>	<u>275</u>	<u>0.4</u>

Potential for Expansion: Limited. An excessively long dam would be required. The Penn-Central railroad which runs along the pond would be affected.

Remarks: The dam is an earthfill structure. A granite block spillway conduit through the fill is not operable. The operating spillway is a stone chute about 10 feet wide and 3 feet deep. The dam is covered with trees and brush.

Ownership and Use: The pond is owned by W. J. Wallis and is used as a storage reservoir.

Existing Site BL-6538(Whitin Reservoir)

Location: On a tributary to the Mumford River at Northwest Main Street in Douglas, Mass.

Oxford, Mass. USGS quadrangle

Surface Area (Acres)	Heigh of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>310</u>	<u>30</u>	<u>5,700</u>	<u>8.9</u>

Potential for Expansion: Limited. About 75 cottages would be affected by expansion. Topography limits any significant increase in surface area.

Remarks: Northwest Main Street forms the dam. The upstream face is vertical stone masonry which flares out into the pool. The downstream face is a vertical granite block wall. The principal spillway is a gate-controlled conduit. The emergency spillway is a concrete box-inlet 15 feet wide by 5 feet high with four 36-inch diameter concrete pipes. The emergency spillway outlets on ledge outcropping. The dam and spillways are in good condition.

Ownership and Use: The reservoir is owned by the Mumford River Reservoir Association and is used for water storage and recreation.

Existing Site BL-6539(Manchaug Pond)

Location: On the Mumford River at Torrey Road in Sutton, Mass. About one-half of the reservoir is in Douglas, Mass.

Oxford, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>350</u>	<u>30</u>	<u>4,200</u>	<u>6.6</u>

Potential for Expansion: Limited. About 50 cottages would be affected. Topography limits any significant increase in surface area.

Remarks: Torrey Road forms the dam. The upstream face is stone masonry. The principal spillway is a gate-controlled concrete riser with a concrete box conduit 10 feet wide by 8 feet high. There is another gate-controlled spillway on the right abutment. The dam and spillway are in good condition.

Ownership and Use: The pond is owned by Manchaug Reservoir Corporation and is used for recreation.

POTENTIAL SITE BL-6614 (cont'd)

Geologic Conditions: The right abutment is englacial drift or glacial till, shallow to bedrock. The left abutment is glacial outwash, shallow to bedrock. Depth to bedrock in the foundation is estimated to be from 15 to 25 feet. Waterholding capabilities appear to be fair to poor. Leakage is expected through the left abutment and the foundation. Borrow material for dam construction was located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

Public Ownership: The upper portion of the potential pool area is within the Upton State Forest.

POTENTIAL SITE BL-6617

Location: On Rock Meadow Brook about 1,900 feet upstream of Hartford Road in Mendon, Mass.

Blackstone, Mass-Rhode Island USGS quadrangle

Latitude: 42°06'27" Longitude: 71°34'58"

Facilities Affected: None below elevation 420.

Geologic Conditions: Both abutments are dense englacial drift, shallow to granite bedrock. Granite bedrock outcrops on both abutments. Depth to granite bedrock in the foundation is estimated to be between 5 and 15 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6620

Location: On Rock Meadow Brook about 1,000 feet upstream of Mendon Street in Uxbridge, Mass.

Blackstone, Mass.-Rhode Island USGS quadrangle

Latitude: 42°05'26" Longitude: 71°35'42"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	2 Houses	320
	Gas Station	320
	House	315
	2 Houses	310
	Clubhouse	305
	Powerline	305
	Mendon Street (Route 16)	305

Geologic Conditions: The left abutment is thin discontinuous englacial drift with schist bedrock outcrops. There is a thin gravel terrace at the toe of the slope. The right abutment is schist bedrock with a gravel terrace near the toe of the slope. Depth to schist bedrock in the foundation is estimated to be from 5 to 15 feet. Waterholding capability appear to be fair to poor. Leakage is expected through the lower portion of the right abutment. Borrow material for dam construction was located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6621

Location: On Meadow Brook about 800 feet upstream from the confluence with Wigwam Brook in Mendon, Mass.

Blackstone, Mass.-Rhode Island USGS quadrangle

Latitude: 42°04'42" Longitude: 71°35'14"

Facilities Affected: None below elevation 340

Geologic Notes: Both abutments are englacial drift, probably shallow to granite and schist bedrock. Granite outcrops on both slopes. Depth to granite or schist bedrock in the foundation is estimated to be from 5 to 15 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

Screen 1 of 2
OCLC: 2050173 Rec stat: n Entrd: 760315 Used: 760315

Type: a Bib lvl: m Govt pub: Lang: eng Source: d Illus: ab
Repr: Enc lvl: 1 Conf pub: 0 Ctry: xx Dat tp: s M/F/R: 00
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Desc: Int lvl: Dates: 1975,

1 010
2 040 WRM c WRM

3 090 FC423.15 b .U5
4 090 b

5 049 AGLL
6 110 10 U. S. b Soil Conservation Service.

7 245 1 Inventory of potential and existing downstream reservoir sites,
Blackstone study area / c [prepared by] U. S. Department of Agriculture, Soil
Conservation Service, Economic Research Service, Forest Service, in cooperation
with the Massachusetts Water Resources Commission.

8 260 1 [Amherst, Mass.] : b The Service, c 1975.
9 300 154 p. : b ill. and col. maps (part fold.) ; c 27 cm.

10 650 0 Reservoirs z Massachusetts.
11 710 10 U. S. b Dept. of Agriculture. b Economic Research Service.

Screen 2 of 2

12 710 10 U. S. b Forest Service.

13 710 10 Massachusetts. b Water Resources Commission.

14 740 1 Massachusetts water resources study.

WRM

1. The first step in the process of the scientific method is to ask a question.

2. The second step is to do background research on the topic.

3. The third step is to form a hypothesis, which is an educated guess about the answer to the question.

4. The fourth step is to design an experiment to test the hypothesis.

5. The fifth step is to conduct the experiment and collect data.

6. The sixth step is to analyze the data and draw a conclusion.

7. The seventh step is to communicate the results of the experiment.

POTENTIAL SITE BL-6622

Location: On Meadow Brook about 400 feet upstream of Blackstone Street in Uxbridge, Mass.

Blackstone, Mass.-Rhode Island USGS quadrangle

Latitude: 42°04'40" Longitude: 71°36'17"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	House	290
	House	285
	5 Houses	280
	3 Sheds	280
	House	275
	Shed	275
	2 Houses	265
	Shed	265
	House	260
	Henry Street	260
	Hollis Street	235

Geologic Conditions: Both abutments are thin discontinuous englacial drift, shallow to granitic bedrock. Granite outcrops on both abutments. Depth to granite bedrock in the foundation is estimated to be from 5 to 15 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was not located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6623

Location: On Wigwam Brook about 500 feet downstream of Asylum Street in Mendon, Mass.

Blackstone, Mass.-Rhode Island USGS quadrangle

Latitude: 42°04'33" Longitude: 71°35'16"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	Asylum Street	295

Geologic Conditions: Both abutments are thin discontinuous englacial drift, shallow to granite or schist bedrock. Bedrock outcrops on both abutments. Depth to granite or schist bedrock in the foundation is estimated to be from 5 to 15 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6624

Location: On Still Corner Brook about 200 feet upstream of Blackstone Street in Uxbridge, Mass.

Blackstone, Mass.-Rhode Island USGS quadrangle

Latitude: 42°04'09" Longitude: 71°36'19"

Facilities None below elevation 280
Affected:

Geologic Both abutments are granitic bedrock overlain by thin dis-
Conditions: continuous englacial drift. Depth to granite bedrock in the foundation is estimated to be from 5 to 15 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering The right abutment is recommended for the excavated emergency
Notes: spillway location.

POTENTIAL SITE BL-6625

Location: On Still Corner Brook about 2,800 feet upstream of Blackstone Street in Uxbridge, Mass.

Blackstone, Mass.-Rhode Island USGS quadrangle

Latitude: 42°03'53" Longitude: 71°35'51"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	Fisher Road	360

Geologic Both abutments are englacial drift, shallow to granitic bed-
Conditions: rock. Granite outcrops on both abutments. Depth to granite bedrock in the foundation is estimated to be from 5 to 15 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering The right abutment is recommended for the excavated emergency
Notes: spillway location.

POTENTIAL SITE BL-6626

Location: On Meadow Brook about 200 feet downstream from the confluence with Wigwam Brook in Mendon, Mass.

Blackstone, Mass.-Rhode Island USGS quadrangle

Latitude: 42°04'39" Longitude: 71°35'27"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	Asylum Street	290

Geologic Conditions: Both abutments are thin discontinuous englacial drift underlain by granite or schist bedrock. Granite and schist bedrock outcrops on both abutments. Depth to granite or schist bedrock in the foundation is estimated to be from 5 to 15 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

SUMMARY DATA FOR POTENTIAL UPSTREAM RESERVOIR SITES

STUDY AREA- BLACKSTONE RIVER										SUBWATERSHED WEST RIVER									
BENEFICIAL POOL										EMERGENCY SPILLWAY									
ELEV	STORAGE	COST PER AC FT	AREA (AC)	COST SURF AC (\$)	DEPTH AT DAM (FT)	CREST ELEV (+) (MSL)	STORAGE AT CREST	COST PER AC FT	DESIGN HIGH WATER	DAM	DESIGN HIGH WATER	DESIGN HIGH WATER	DESIGN HIGH WATER	DESIGN HIGH WATER	DESIGN HIGH WATER	DESIGN HIGH WATER	DESIGN HIGH WATER	DESIGN HIGH WATER	DESIGN HIGH WATER
(MSL)	AC FT IN	AC FT (\$)	(AC)	AC (\$)	(FT)	(MSL)	AC FT IN	AC FT (\$)	(MSL)	(AC)	(MSL)	(AC)	(MSL)	(AC)	(MSL)	(AC)	(MSL)	(AC)	(MSL)
DA= 1.00 SQ MI = 640 AC										USGS QUAD- GRAFTON									
STREAM WATER QUALITY (B)										100-YR PRIN SPWY DESIGN STORM									
SITE RATING (1)	0	0.0	8	8	0.8	406.6	E	221	4.1	930	408.9	90	411.9	12	20	401 CFS	401 CFS	401 CFS	401 CFS
SITE-BL-6603	400.7	100	2750	46	5990	4.5	407.0	E	255	4.8	1080	409.4	95	412.4	12	22	401 CFS	401 CFS	401 CFS
	404.5	100	2750	46	5990	4.5	407.0	E	255	4.8	1080	409.4	95	412.4	12	22	401 CFS	401 CFS	401 CFS
	407.2	264	1460	74	5260	7.3	409.7	E	485	9.1	800	412.0	114	415.5	15	35	401 CFS	401 CFS	401 CFS
	410.9	593	850	107	4720	10.8	413.4	E	888	16.7	570	414.7	132	418.0	18	49	401 CFS	401 CFS	401 CFS
	412.5	772	710	117	4650	12.5	415.0	E	1095	20.5	500	416.2	141	419.4	19	56	401 CFS	401 CFS	401 CFS
DA= 0.70 SQ MI = 448 AC										USGS QUAD- GRAFTON									
STREAM WATER QUALITY (B)										100-YR PRIN SPWY DESIGN STORM									
SITE RATING (1)	0	0.0	3	3	3.3	417.7	E	155	4.1	3310	422.0	26	427.2	27	113	280 CFS	280 CFS	280 CFS	280 CFS
SITE-BL-6604	403.2	100	6250	15	40800	14.7	417.2	E	148	4.0	4240	423.0	28	427.5	28	117	280 CFS	280 CFS	280 CFS
	414.7	100	6250	15	40800	14.7	417.2	E	148	4.0	4240	423.0	28	427.5	28	117	280 CFS	280 CFS	280 CFS
	421.7	239	3290	25	31340	21.7	424.2	E	310	8.3	2540	428.7	38	433.0	33	171	280 CFS	280 CFS	280 CFS
	430.2	517	2020	41	25710	30.2	432.7	E	628	16.7	1660	436.2	48	440.2	40	260	280 CFS	280 CFS	280 CFS
	436.4	794	1570	48	26010	36.4	438.9	E	924	24.7	1350	442.0	55	445.7	46	343	280 CFS	280 CFS	280 CFS
	439.2	933	1440	51	26160	39.2	441.7	E	1074	28.7	1250	444.5	59	448.2	48	384	280 CFS	280 CFS	280 CFS
DA= 1.20 SQ MI = 768 AC										USGS QUAD- GRAFTON									
STREAM WATER QUALITY (B)										100-YR PRIN SPWY DESIGN STORM									
SITE RATING (3)	0	0.0	2	2	8.8	385.2	E	266	4.1	3650	390.7	41	396.6	39	201	481 CFS	481 CFS	481 CFS	481 CFS
SITE-BL-6606	366.9	100	14090	19	74090	20.9	378.9	N	110	1.7	12860	394.5	52	404.7	47	315	481 CFS	481 CFS	481 CFS
	378.9	100	14090	19	74090	20.9	378.9	N	110	1.7	12860	394.5	52	404.7	47	315	481 CFS	481 CFS	481 CFS
	388.1	350	4240	35	42060	30.0	390.6	E	455	7.1	3260	396.5	58	401.6	44	267	481 CFS	481 CFS	481 CFS
	398.4	850	2180	63	29290	40.4	400.9	E	1031	16.1	1800	405.0	84	409.6	52	396	481 CFS	481 CFS	481 CFS
	408.0	1600	1330	93	22910	50.0	410.5	E	1850	28.9	1150	413.2	106	417.5	60	553	481 CFS	481 CFS	481 CFS

NOTES - (1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.

(2) EMERGENCY SPILLWAY STORAGE AND COSTS ARE BASED ON TOTAL STORAGE, INCLUDING BENEFICIAL POOL.

(3) EMERGENCY SPILLWAY TYPE CODE- C=CONCRETE CHUTE, D=CONCRETE DROP, E=EXCAVATED, T= TWO SPILLWAYS, N= NONE

(4) TABULAR DATA ARE BASED ON PRELIMINARY INFORMATION. FIGURES SHOWN ARE PRIMARILY FOR COMPARISON PURPOSES.

(5) ELEVATIONS ARE SHOWN TO THE NEAREST 0.1 FOOT TO SHOW VARIATION BETWEEN DEVELOPMENTS ONLY, AND ARE NOT TO BE CONSIDERED ACCURATE TO THAT DEGREE.

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SUMMARY DATA FOR POTENTIAL UPSTREAM RESERVOIR SITES

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SUMMARY DATA FOR POTENTIAL UPSTREAM RESERVOIR SITES

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STUDY AREA- BLACKSTONE RIVER										SUBWATERSHED WEST RIVER									
BENEFICIAL POOL																			
ELEV	STORAGE	PER AC FT	AREA (AC)	COST (\$)	SURF AC	DEPTH AT DAM (FT)	CREST ELEV	STORAGE AT CREST	COST PER AC FT	DESIGN HIGH WATER	DAM	SAFE YIELD	AT 95	PERCENT	CHANCE	FILL VOL (1000 CY)	HGT	ELEV	TOP
(MSL)	AC FT	IN	(AC)	(AC)	(AC)	(AC)	(AC)	(AC)	(AC)	(AC)	(AC)	(AC)	(AC)	(AC)	(AC)	(AC)	(AC)	(AC)	(AC)
DA= 4.20 SQ MI = 2688 AC										LATIT+DE 42-10-58 LONGITUDE 71-37-42									
STREAM WATER QUALITY (B) 100-YR PRIN SPWY DESIGN STORM										RUNOFF = 7.00 IN, PEAK FLOW = 1682 CFS									
SITE-BL-6614	SITE RATING (2)	0	0.0	21	2.7	2.7	321.4	E	930	4.1	1260	329.2	128	339.0	35	198	81	0.35	0.35
306.7	0	0.4	8410	45	18640	5.9	309.9	N	134	0.6	6290	320.2	87	327.1	23	81	0.35	0.35	0.35
309.9	100	0.4	8410	45	18640	5.9	309.9	N	134	0.6	6290	320.2	87	327.1	23	81	0.35	0.35	0.35
322.7	1017	4.5	1840	98	19050	18.7	322.7	N	1050	4.6	1780	337.0	160	348.9	45	356	533	2.65	2.65
336.7	2850	12.7	910	159	16240	32.8	336.7	N	2884	12.8	900	347.1	226	357.1	53	533	2.65	2.65	2.65
350.5	5600	25.0	580	250	13000	46.5	350.5	T	5634	25.2	580	356.5	272	359.7	56	600	3.49	3.49	3.49
DA= 1.60 SQ MI = 1024 AC										LATITUDE 42-06-27 LONGITUDE 71-34-58									
STREAM WATER QUALITY (B) 100-YR PRIN SPWY DESIGN STORM										RUNOFF = 7.00 IN, PEAK FLOW = 628 CFS									
SITE-BL-6617	SITE RATING (1)	0	0.0	9	10.3	10.3	414.9	E	354	4.1	1130	417.0	196	420.0	20	17	17	17	17
410.2	0	0.0	9	10.3	10.3	10.3	414.9	E	354	4.1	1130	417.0	196	420.0	20	17	17	17	17
THIS SITE LACKS SUFFICIENT STORAGE FOR BENEFICIAL WATER.																			
DA= 3.00 SQ MI = 1920 AC										LATITUDE 42-05-26 LONGITUDE 71-35-42									
STREAM WATER QUALITY (B) 100-YR PRIN SPWY DESIGN STORM										RUNOFF = 7.00 IN, PEAK FLOW = 735 CFS									
SITE-BL-6620	SITE RATING (2)	0	0.0	11	7.6	7.6	311.2	E	664	4.1	1520	315.7	76	320.0	34	97	97	97	97
293.6	0	0.6	9260	26	35910	13.0	301.5	E	198	1.2	4680	310.7	61	317.1	31	75	75	75	75
299.0	100	0.6	9260	26	35910	13.0	301.5	E	198	1.2	4680	310.7	61	317.1	31	75	75	75	75
303.2	232	1.5	4290	38	26150	17.2	305.7	E	362	2.3	2760	312.4	66	316.9	31	73	73	73	73
308.9	497	3.0	2380	55	21430	22.9	311.4	E	671	4.1	1770	316.1	77	319.1	33	90	90	90	90
312.5	719	4.5	2070	66	22430	26.5	312.5	T	743	4.6	2000	317.6	82	320.6	35	114	114	114	114

NOTES - (1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.
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** DO NOT USE FOR FINAL SITE SELECTION OR LAND ACQUISITION. **

SUMMARY DATA FOR POTENTIAL UPSTREAM RESERVOIR SITES

STUDY AREA- BLACKSTONE RIVER															SUBWATERSHED WEST RIVER																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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ELEV	STORAGE	CUST PER AC FT	AREA (AC)	COST/ SURF AC (\$)	DEPTH AT DAM (FT)	CREST ELEV (MSL)	STORAGE AT CREST AC FT	COST PER AC FT (\$)	DESIGN HIGH WATER	DAM	SAFE YIELD	PERCENT CHANCE	FILL VOL (1000 CY)	HGT FT	TOP ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV 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(AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV 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(AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV 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(MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL)	AREA (AC)	ELEV (MSL

NOTES - (1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.
 (2) EMERGENCY SPILLWAY STORAGE AND COSTS ARE BASED ON TOTAL STORAGE, INCLUDING BENEFICIAL POOL.
 (3) EMERGENCY SPILLWAY TYPE CODE- C=CONCRETE CHUTE, D=CONCRETE DROP, E=EXCAVATED, T= TWO SPILLWAYS, N= NONE
 (4) TABULAR DATA ARE BASED ON PRELIMINARY INFORMATION. FIGURES SHOWN ARE PRIMARILY FOR COMPARISON PURPOSES.
 (5) ELEVATIONS ARE SHOWN TO THE NEAREST 0.1 FOOT TO SHOW VARIATION BETWEEN DEVELOPMENTS ONLY, AND ARE NOT TO BE CONSIDERED ACCURATE TO THAT DEGREE.

** DO NOT USE FOR FINAL SITE SELECTION OR LAND ACQUISITION. **

SUBWATERSHED WEST RIVER

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***** STUDY AREA- BLACKSTONE RIVER SUBWATERSHED WEST RIVER *****
***** BENEFICIAL POOL ***** EMERGENCY SPILLWAY ***** DESIGN ***** DAM ***** SAFE *****
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[illegible]

SITE-BL-6624

[illegible]

SITE-BL-6625

SITE RATING	(1)	STREAM WATER QUALITY (B)	100-YR PRIN SPWY DESIGN	STORM	RUNOFF = 7.00 IN, PEAK FLOW =	LONGITUDE	362 CFS							
342.5	0	0.0	6	2.5	352.5 E	221	4.1	1130	355.2	100	358.4	18	20	362 CFS
349.7	100	1.9	22	9.7	352.2 E	202	3.8	1640	355.7	107	358.7	19	21	362 CFS
351.2	152	2.9	41	11.2	353.7 E	305	5.6	1220	356.5	119	359.5	19	26	362 CFS
352.2	205	3.8	2020	12.3	354.7 E	405	7.6	1020	357.1	128	360.1	20	31	362 CFS
352.5	216	4.0	2010	12.5	355.0 E	422	7.8	1030	357.0	127	360.0	20	29	362 CFS

SITE-BL-6626

SITE-BL-6626		DA= 2.50 SQ MI = 1600 AC		USGS QUAD- BLACKSTONE		LATITUDE 42-04-39		LONGITUDE 71-35-27											
SITE RATING		STREAM WATER QUALITY (B)		100-YR PRIN SPWY DESIGN		RUNOFF = 7.00 IN, PEAK FLOW =		787 CFS											
(1)																			
294.7	0	0.0	7	6.6	*	321.7	E	553	4.1	1000	*	329.7	57	*	337.4	49	120	*	*****
303.4	100	0.8	16	15.3	*	305.9	E	162	1.2	2710	*	317.6	27	*	325.4	37	63	*	0.30
320.0	471	3.5	29	32.0	*	322.5	E	576	4.3	1160	*	332.2	69	*	338.9	51	129	*	0.79
334.4	1212	9.1	80	46.4	*	334.4	N	1232	9.2	710	*	342.6	118	*	348.9	61	201	*	1.35
342.5	2027	15.2	117	54.5	*	342.5	T	2047	15.3	640	*	347.5	137	*	350.5	62	226	*	1.72

NOTES - (1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.

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- (3) EMERGENCY SPILLWAY TYPE CODE- C=CONCRETE CHUTE, D=CONCRETE DROP, E=EXCAVATED, T= TWO SPILLWAYS, N= NONE
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DO NOT USE FOR FINAL SITE SELECTION OR LAND ACQUISITION.

Existing Site BL-6627(Cider Mill Pond)

Location: On the West River about 900 feet downstream from Stowe Road in Grafton, Mass.

Grafton, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>5</u>	<u>8</u>	<u>3,100</u>	<u>4.8</u>

Potential for Expansion: Please refer to Site Data and Design Summary Table for Potential Site BL-6610 for details.

Remarks: The dam is an earthfill structure with a vertical stone wall on the downstream face. The spillway is a flashboard-controlled weir about 8 feet long and 2 feet deep. Water discharges into a concrete chute. There is also a spillway to an old cider mill. Many of the stones in the downstream wall have displaced. Concrete in the spillway is cracked. The dam has little freeboard.

Ownership and Use: The pond is owned by abutters and is used for recreation. The dam is owned by Alice and Harold Ide.

Existing Site BL-6628(Silver Lake)

Location: On the West River about 50 feet upstream from Route 140 in Grafton, Mass.

Grafton, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>25</u>	<u>15</u>	<u>3,500</u>	<u>5.5</u>

Potential for Expansion: Please refer to Site Data and Design Summary Table for Site BL-6610 which is located immediately upstream from Silver Lake. Expansion of Silver Lake would affect essentially the same facilities.

Remarks: The dam is an earthfill structure with vertical stone faces. The spillway is a concrete and stone weir about 50 feet long and 3 feet deep. Large trees and brush are growing on the dam. There is some erosion near the spillway.

Ownership and Use: The lake is owned by Glendin Bradan and is used for recreation.

Existing Site BL-6629(Lake Wildwood)
(Jordon Pond)

Location: On the West River about 1500 feet upstream from Williams Street in Upton, Mass.

Grafton, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>35</u>	<u>15</u>	<u>4,700</u>	<u>5.0</u>

Potential for Expansion: A railroad, Route 140, and about 20 cottages would be affected by expansion.

Remarks: The dam is an earthfill structure. The spillway is a concrete ogee weir section about 50 feet long and 6 feet deep which outlets to a rock-lined impact basin. There is also a gate-controlled spillway on the right side of the ogee section. The dam and spillway are in good condition.

Ownership and Use: The lake is owned by the Town of Upton and is used for recreation.

Existing Site BL-6630(Pratt Pond)

Location: On Center Brook at Old Dam Road in Upton, Mass.

Milford, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>35</u>	<u>6</u>	<u>1,700</u>	<u>2.7</u>

Potential for Expansion: Lakeview Cemetery, Hopkinton Road, and several houses would be affected by expansion.

Remarks: The dam is an earthfill structure with vertical stone faces. The spillway is a concrete weir about 6 feet long and 3 feet deep. Trees are growing on the dam. Concrete in the spillway wingwalls has cracked and broken away. Water has apparently overtopped the dam.

Ownership and Use: The pond is owned by the Town of Upton and is used for recreation.

Existing Site BL-6631

Location: On Center Brook at Route 140 in Upton, Mass.

Milford, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>5</u>	<u>15</u>	<u>1,750</u>	<u>2.7</u>

Potential for Expansion: Limited. The pond is surrounded by streets and houses. Pratt Pond (Site BL-6630) is located immediately upstream.

Remarks: Route 140 forms the dam. The upstream face is a vertical concrete wall. The spillway is a concrete riser with gate-controlled flashboards. The riser has two bays each about 5 feet wide and 5 feet deep.

Ownership and Use: The pond is owned by the Town of Upton and is used for recreation.

Existing Site BL-6632(Taft Pond)

Location: On Taft Pond Brook about 150 feet upstream from South Street in Upton, Mass.

Milford, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>10</u>	<u>6</u>	<u>650</u>	<u>1.0</u>

Potential for Expansion: Raising the pond level by 15 feet would affect a road and about 10 cottages. Surface area would be about 40 acres.

Remarks: The dam is an earthfill structure with a vertical stone downstream face. The principal spillway is a concrete and stone weir about 3 feet long and 3 feet deep. Water spills over a short concrete chute and drops 6 feet to a rock-lined basin. There is also an auxiliary spillway located adjacent to the weir; a concrete weir 4 feet long and 1 foot deep. Large trees are growing on the dam.

Ownership and Use: The pond is owned by Philip Reilly and is used for fishing.

Existing Site BL-6633 (West Hill Dam)

Location: On the West River about 2400 feet upstream from Hartford Road in Uxbridge, Mass.

Blackstone, Mass.-R.I. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>0</u>	<u>51</u>	<u>17,900</u>	<u>28</u>

Potential for Expansion: It may be possible to establish a permanent pool at the site. Flood storage would need to be increased to compensate for the loss due to the permanent pool. Expansion of the dam would probably be very costly.

Remarks: The dam is an earthfill structure with a dumped rock shell. There are also four auxiliary dikes. The principal spillway is a series of gated inlets. The emergency spillway is a concrete weir about 50 feet long.

Ownership and Use: The dam is owned by the U. S. Army Corps of Engineers and is used for flood control.

Existing Site BL-6634(Pout Pond)

Location: On an unnamed tributary to the West River about 600 feet upstream from West River Street in Uxbridge, Mass.

Blackstone, Mass.-R.I. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>7</u>	<u>6</u>	<u>50</u>	<u>0.1</u>

Potential for Expansion: Limited by the very small drainage area. This is an enlarged natural pond.

Remarks: The dam is an earthfill structure. The fill material is gravelly and pervious. The spillway is a 24-inch diameter corrugated metal pipe. The dam is in poor condition.

Ownership and Use: The pond is owned by the town of Uxbridge and is used for recreation and wildlife habitat.

Existing Site BL-6635(Wheelockville Pond)

Location: On the West River about 200 feet upstream from Route 16 in Uxbridge, Mass.

Blackstone, Mass. - R.I. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>35</u>	<u>12</u>	<u>20,800</u>	<u>32.5</u>

Potential for Expansion: Limited. The West Hill Flood Control dam is located immediately upstream of Wheelockville Pond.

Remarks: The dam is an earthfill structure. The principal spillway is a concrete weir about 50 feet long and 2 feet deep. There is also a gate-controlled spillway on the right abutment. The dam and spillways are in good condition.

Ownership and Use: The pond is owned by Mattawin Textile Ltd. and is used as a storage reservoir.



BL-6627
Cider Mill Pond



BL-6630
Pratt Pond



BL-6628
Silver Lake

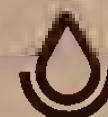


BL-6631
Mill Pond



BL-6629
Lake Wildwood

EXISTING RESERVOIRS
SUBWATERSHED BL-66
WEST RIVER





BL-6632
Taft Pond



BL-6634
Pout Pond



BL-6635

EXISTING RESERVOIRS
SUBWATERSHED BL-66
WEST RIVER





BLACKSTONE STUDY AREA
SITE DATA FOR

Subwatershed BL-67, Mill River

The Mill River subwatershed covers about 28,200 acres in Blackstone, Hope-dale, Mendon, Milford, Millville, and Upton, all in Worcester County, and Bellingham, Franklin, Hopkinton, and Wrentham; all in Norfolk County, and Hopkinton in Middlesex County.

The subwatershed includes the drainage area of the Mill River from its origin in Hopkinton, Massachusetts to Harris Pond on the Massachusetts-Rhode Island border in Blackstone, Massachusetts.

Geology of the potential reservoir sites is characterized by 5 to 30 feet of glacial till underlain by granite bedrock.

Six potential reservoir sites and 12 existing reservoirs were studied.

POTENTIAL SITE BL-6701

Location: On Spring Brook about 3,200 feet upstream of Providence Street in Mendon, Mass.

Blackstone, Mass.-Rhode Island USGS quadrangle

Latitude: 42°05'04" Longitude: 71°32'36"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	3 Houses	350
	Barn	350
	Blackstone Street	350

Geologic Conditions: Both abutments are granitic gneiss with a thin mantle of dense glacial till. Bedrock outcrops in the foundation. Water-holding capabilities appear to be good. Borrow material for dam construction was not located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6702

Location: On Round Meadow Brook about 100 feet upstream of Providence Street in Mendon, Mass.

Blackstone, Mass.-Rhode Island USGS quadrangle

Latitude: 42°04'07"

Longitude: 71°31'33"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	3 Houses	250
	Shed	250
	Quisset Road	250
	Shed	245
	House	235
	Shed	235

Geologic Conditions: Both abutments are silty sand and gravel, shallow to bedrock. Depth to granitic bedrock in the foundation is estimated to be less than 10 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6703

Location: On Hop Brook about 150 feet upstream of Milk Street in Blackstone, Mass.

Blackstone, Mass.-Rhode Island USGS quadrangle

Latitude: 42°02'52"

Longitude: 71°32'08"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	Gas Station	280
	House	275
	Lincoln Street	275
	House	270

Geologic Conditions: Both abutments are silty, sand and gravel. Depth to bedrock in the foundation is estimated to be 20 to 30 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6704

Location: On Muddy Brook about 400 feet upstream of Bellingham Road in Mendon, Mass.

Blackstone, Mass. USGS quadrangle

Latitude: 42°05'36"

Longitude: 71°32'04"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	House	260
	Shed	260
	7 Houses	255
	Cemetery	255
	6 Sheds	255
	Drive-In Theater	255
	4 Houses	250
	Gasline	250
	2 Sheds	250
	House	245
	2 Sheds	245
	Tennis Court	245
	George Street	245
	Telephone Cable	235

Geologic Conditions: Both abutments are silty sand and gravel with large boulders. Depth to bedrock in the foundation is estimated to be from 20 to 30 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6705

Location: On the Mill River about 3,400 feet upstream of Whitewood Road on Milford - Upton town boundary.

Milford, Mass. USGS quadrangle

Latitude: 42°10'44"

Longitude: 71°33'46"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	South Street	350
	Powerline	350

Geologic Conditions: Both abutments are granitic gneiss bedrock overlain by thin discontinuous glacial till. Depth to granitic gneiss bedrock in the foundation is estimated to be from 5 to 10 feet. Waterholding capabilities appear to be good. Borrow material for dam construction was located about one-half mile from the site.

POTENTIAL SITE BL-6705 (cont'd)

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6706

Location: On Peters River about 100 feet upstream of Boulevard Street in Bellingham, Mass.

Franklin, Mass.-Rhode Island USGS quadrangle

Latitude: 42°02'09"

Longitude: 71°28'04"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	9 Houses	210
	4 Sheds	210
	Lumber Yard	210
	Road	210
	Cross Street	210
	8 Houses	200
	3 Sheds	200
	Shop	200

Geologic Conditions: Both abutments are englacial drift or ground moraine sand and gravel with large boulders. Depth to bedrock in the foundation is estimated to be from 40 to 50 feet. Water-holding capabilities appear to be poor. Leakage is expected through both abutments. Previous borrow material for dam construction was located near the site; impervious material was not located.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

SUMMARY DATA FOR POTENTIAL UPSTREAM RESERVOIR SITES

STUDY AREA- BLACKSTONE RIVER										SUBWATERSHED MILL RIVER									
BENEFICIAL POOL										EMERGENCY SPILLWAY									
ELEV	STORAGE	COST PER AC FT	AREA (AC)	COST/ SURF AC	DEPTH AT DAM (FT)	CREST ELEV	STORAGE AT CREST	COST PER AC FT											
(MSL)	AC FT IN	(\$)	(AC)	(\$)	(FT)	(MSL)	AC FT IN	(\$)											
DA= 1.80 SQ MI = 1152 AC										USGS QUAD- BLACKSTONE									
STREAM WATER QUALITY (B)										100-YR PRIN SPWY DESIGN STORM									
SITE RATING (1)																			
314.2	0	0.0	10	10	2.3	325.5	E	398	4.1	750	*	329.9	79	*	336.0	24	34	*	*****
319.2	100	1.0	4190	31	13390	319.2	N	114	1.2	3660	*	331.2	84	*	340.5	28	58	*	0.27
327.0	483	5.0	1000	66	7350	329.5	E	675	7.0	720	*	334.6	100	*	339.9	28	55	*	0.70
336.0	1250	13.0	570	106	6690	338.5	E	1542	16.1	460	*	341.9	139	*	346.4	34	102	*	1.15
342.2	2017	21.0	480	142	6830	344.7	E	2411	25.1	400	*	346.7	177	*	349.9	38	143	*	1.42
342.5	2055	21.4	490	144	6930	345.0	E	2453	25.6	410	*	346.9	178	*	349.9	38	142	*	1.43
DA= 1.10 SQ MI = 704 AC										USGS QUAD- BLACKSTONE									
STREAM WATER QUALITY (B)										100-YR PRIN SPWY DESIGN STORM									
SITE RATING (1)																			
208.2	0	0.0	4	4	4.3	230.2	C	243	4.1	4020	*	235.2	33	*	241.3	37	126	*	*****
221.7	100	1.7	10260	11	91580	221.7	N	109	1.9	9430	*	237.6	43	*	248.2	44	193	*	0.23
230.0	227	3.9	4680	20	52760	230.0	E	236	4.0	4500	*	237.7	39	*	243.0	39	140	*	0.37
238.3	482	8.2	2430	40	29090	238.3	C	491	8.3	2380	*	243.1	66	*	246.3	42	173	*	0.57
242.5	685	11.7	1900	62	20960	242.5	C	694	11.8	1880	*	246.3	90	*	249.3	45	208	*	0.67
DA= 1.90 SQ MI = 1216 AC										USGS QUAD- BLACKSTONE									
STREAM WATER QUALITY (B)										100-YR PRIN SPWY DESIGN STORM									
SITE RATING (1)																			
247.3	0	0.0	8	8	3.4	263.4	E	421	4.1	1020	*	265.9	56	*	268.9	25	52	*	*****
254.1	100	1.0	3350	22	15260	256.6	E	176	1.7	1910	*	259.0	32	*	262.0	18	23	*	0.27
260.5	285	2.8	1740	36	13830	263.0	E	401	4.0	1240	*	265.4	54	*	268.4	24	50	*	0.52
268.0	655	6.5	1280	63	13270	270.5	E	840	8.3	1000	*	272.9	86	*	275.9	32	98	*	0.85
272.5	983	9.7	1130	84	13220	275.0	E	1226	12.1	900	*	277.4	109	*	280.4	36	153	*	1.06

- NOTES - (1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.
 (2) EMERGENCY SPILLWAY STORAGE AND COSTS ARE BASED ON TOTAL STORAGE, INCLUDING BENEFICIAL POOL.
 (3) EMERGENCY SPILLWAY TYPE CODE- C=CONCRETE CHUTE, D=CONCRETE DROP, E=EXCAVATED, T= TWO SPILLWAYS, N= NONE
 (4) TABULAR DATA ARE BASED ON PRELIMINARY INFORMATION. FIGURES SHOWN ARE PRIMARILY FOR COMPARISON PURPOSES.
 (5) ELEVATIONS ARE SHOWN TO THE NEAREST 0.1 FOOT TO SHOW VARIATION BETWEEN DEVELOPMENTS ONLY, AND ARE NOT TO BE CONSIDERED ACCURATE TO THAT DEGREE.

** DO NOT USE FOR FINAL SITE SELECTION OR LAND ACQUISITION. **

SUMMARY DATA FOR POTENTIAL UPSTREAM RESERVOIR SITES

STUDY AREA- BLACKSTONE RIVER												SUBWATERSHED MILL RIVER											
BENEFICIAL POOL												EMERGENCY SPILLWAY											
ELEV	STORAGE	COST PER AC FT	AREA (AC)	COST/ SURF AC	DEPTH AT DAM	CREST ELEV	STORAGE AT CREST	COST PER AC FT	DESIGN HIGH WATER	DAM	SAFE YIELD												
(MSL)	AC FT	IN	(AC)	(\$)	(FT)	TYPE	AC FT	IN	(MSL)	(AC)	(MGD)												
DA= 3.60 SQ MI = 2304 AC												USGS QUAD- BLACKSTONE											
STREAM WATER QUALITY (B)												100-YR PRIN SPWY DESIGN STORM											
SITE-BL-6704												LATITUDE 42-05-36 LONGITUDE 71-32-04											
SITE RATING (1)												RUNOFF = 6.80 IN, PEAK FLOW = 1401 CFS											
220.1	0	0.0	10	7270	6.1	238.3	E	1009	5.3	640	240.7												
225.1	100	0.5	30	24410	11.1	225.1	T	129	0.7	5640	238.0												
236.1	740	3.9	96	12530	22.1	242.6	E	1559	8.1	770	245.1												
245.7	2021	10.5	170	11520	31.7	250.2	E	2893	15.1	680	252.7												
252.5	3351	17.5	225	10910	38.5	255.0	E	3970	20.7	620	257.2												
SITE-BL-6705												USGS QUAD- MILFORD											
STREAM WATER QUALITY (B)												100-YR PRIN SPWY DESIGN STORM											
SITE RATING (1)												LATITUDE 42-10-44 LONGITUDE 71-33-46											
RUNOFF = 6.80 IN, PEAK FLOW = 1907 CFS																							
309.2	0	0.0	6	7770	11.3	337.2	E	1085	4.1	890	343.6												
317.2	100	0.4	20	39420	19.2	317.2	N	139	0.5	5580	326.5												
329.0	480	1.7	46	22480	31.0	329.0	N	519	2.0	1970	339.6												
339.2	1240	4.6	105	13030	41.3	341.7	E	1677	6.4	820	346.0												
342.5	1755	6.6	208	9070	44.5	342.5	T	1794	6.8	1050	347.0												
SITE-BL-6706												USGS QUAD- FRANKLIN											
STREAM WATER QUALITY (B)												100-YR PRIN SPWY DESIGN STORM											
SITE RATING (3)												LATITUDE 42-02-09 LONGITUDE 71-28-04											
RUNOFF = 6.80 IN, PEAK FLOW = 1621 CFS																							
196.8	100	0.4	55	13890	4.9	196.8	T	142	0.5	9760	205.8												
199.1	248	0.8	80	6870	7.1	199.1	T	291	1.0	5870	206.1												
200.7	397	1.4	103	5290	8.7	200.7	T	439	1.6	4770	207.5												
202.5	602	2.0	133	3890	10.5	202.5	T	645	2.3	3630	207.5												

NOTES - (1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.

(2) EMERGENCY SPILLWAY STORAGE AND COSTS ARE BASED ON TOTAL STORAGE, INCLUDING BENEFICIAL POOL.

(3) EMERGENCY SPILLWAY TYPE CODE- C=CONCRETE CHUTE, D=CONCRETE DROP, E=EXCAVATED, T= TWO SPILLWAYS, N= NONE

(4) TABULAR DATA ARE BASED ON PRELIMINARY INFORMATION. FIGURES SHOWN ARE PRIMARILY FOR COMPARISON PURPOSES.

(5) ELEVATIONS ARE SHOWN TO THE NEAREST 0.1 FOOT TO SHOW VARIATION BETWEEN DEVELOPMENTS ONLY, AND ARE NOT TO BE CONSIDERED ACCURATE TO THAT DEGREE.

** DO NOT USE FOR FINAL SITE SELECTION OR LAND ACQUISITION. **

Existing Site BL-6707(North Pond)

Location: On the Mill River about 600 feet downstream from the Hopkinton-Milford town line. The major portion of the reservoir is in Hopkinton, Mass.

Milford, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>240</u>	<u>15</u>	<u>2,000</u>	<u>3.1</u>

Potential for Expansion: About 75 cottages surrounding the pond would be affected by expansion. The pond area is already large in relation to the drainage area.

Remarks: The dam is an earthfill structure with vertical masonry walls. The principal spillway is a granite block weir about 30 feet long and 3 feet deep. There is also a gate-controlled spillway on the right abutment. Seepage was observed at the downstream toe of the dam.

Ownership and Use: The pond is owned by Draper Corp. and is used for water storage and recreation.

Existing Site BL-6708(Fiske Millpond)

Location: On the Mill River about 300 feet upstream from Fiske Mill Road on the Milford-Upton, Mass. town line.

Milford, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>20</u>	<u>15</u>	<u>3,700</u>	<u>5.8</u>

Potential for Expansion: Raising the pond level by 20 feet would affect White-wood Road and Pond Street. Surface area would be about 150 acres. North Pond(Site BL-6707) is located upstream. It's 240 acre surface area may adversely affect summer flows into Fiske Millpond.

Remarks: The dam is an earthfill structure. The upstream face is a vertical concrete wall. The principal spillway is a concrete weir about 50 feet long and 3 feet deep. There is also a gate-controlled 30-inch diameter concrete pipe spillway. Dam and spillways are in good condition.

Ownership and Use: The pond is owned by Draper Corp. and is used for water storage and recreation.

Existing Site BL-6709

Location: On an unnamed tributary to the Mill River about 100 feet upstream from Fiske Mill Road in Milford, Mass.

Milford, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>5</u>	<u>10</u>	<u>250</u>	<u>0.4</u>

Potential for Expansion: The small drainage area limits expansion potential.

Remarks: The dam is an earthfill structure. The principal spillway is a concrete weir about 15 feet long and 2 feet deep. An auxiliary spillway on the left abutment is a weir about 10 feet wide and 2 feet deep. Most of this spillway has collapsed. Trees are growing on the dam. Concrete in the principal spillway has cracked and crumbled.

Ownership and Use: The pond is owned by High Head Trust Company and is used for fishing.

Existing Site BL-6710

Location: On the Mill River about 100 feet upstream of Milford Street on the Milford-Hopedale town line.

Milford, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>25</u>	<u>15</u>	<u>4,300</u>	<u>6.7</u>

Potential for Expansion: Raising the pool level by 15 feet would affect Fiske Mill Road. Surface area would be about 125 acres. North Pond(Site BL-6707) is located upstream. It's 240 acre surface area may adversely affect summer flows into this pond.

Remarks: The dam is an earthfill structure. The upstream face is a vertical concrete wall. The downstream slope is grouted riprap. The principal spillway is a concrete weir with flashboards. The weir is about 10 feet long and 8 feet deep. There is rock riprap on the upstream slope at both abutments. The dam and spillway are in good condition.

Ownership and Use: The pond is owned by Draper Corp. and is used for water storage and recreation.

Existing Site BL-6711(Hopedale Pond)

Location: On the Mill River in downtown Hopedale, Mass.

Milford, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>90</u>	<u>25</u>	<u>6,650</u>	<u>10.4</u>

Potential for Expansion: Limited. The dam site has been developed with streets and houses.

Remarks: Freedom Street forms the dam. The upstream face is a vertical concrete wall. The principal spillway is a concrete weir about 75 feet long and 4 feet deep with flashboard control. There are 5 inlet bays, each 15 feet long. Water drops about 20 feet to a series of 9 arched bays under a mill building.

Ownership and Use: The pond is owned by Draper Corp. and is used for water storage and recreation.

Existing Site BL-6712(Spindleville Pond)

Location: On the Mill River at Mill Street in Hopedale, Mass.

Blackstone Mass - R. I. USGS quadrangle

Surface Area (Acres)	Height of Dam (Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>15</u>	<u>15</u>	<u>7,800</u>	<u>12.2</u>

Potential for Expansion: Limited. A sewage disposal plant, railroad, street and houses would be affected.

Remarks: Mill Street forms the dam. The spillway is a 15 foot wide by 6 foot deep stone culvert with flashboards at the downstream end. Water discharges onto a chute cut through rock ledge.

Ownership and Use: The pond is owned by Mike Coglianaro and is used for mill storage.

Existing Site BL-6713(Lakeview Pond)

Location: On an unnamed tributary to the Peters River about 800 feet upstream from South Main Street in Bellingham, Mass.

Franklin, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>10</u>	<u>10</u>	<u>300</u>	<u>0.5</u>

Potential for Expansion: Any significant expansion would affect an upstream housing development. The small drainage area limits expansion potential.

Remarks: The dam is an earthfill structure. The principal spillway is a granite block weir about 6 feet long and 3 feet deep. The spillway is located on the downstream side of the dam. The inlet on the upstream side is not visible. Trees and brush are growing on the dam.

Ownership and Use: The pond is owned by a real estate development company and is used for recreation.

Existing Site BL-6714(Silver Lake)

Location: On the Peters River about 300 feet upstream from Cross Street in Bellingham, Mass.

Franklin, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>45</u>	<u>10</u>	<u>1,050</u>	<u>1.6</u>

Potential for Expansion: Raising the present lake level by 10 feet would affect about 50 cottages and 2 streets. Surface area would be about doubled.

Remarks: The dam is an earthfill structure. The spillway is a stone weir about 5 feet long and 3 feet deep which outlets to a stone chute. Trees and brush are growing on the dam.

Ownership and Use: The lake is privately owned and is used for recreation.

Existing Site BL-6715(Hales Pond)

Location: On Bungay Brook at Jenks Street in Wrentham, Mass.
Franklin, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>5</u>	<u>15</u>	<u>1,550</u>	<u>2.4</u>

Potential for Expansion: Raising the existing pond level by 30 feet would affect 2 streets. Surface area would be about quadrupled.

Remarks: Jenks Street forms the dam. The inlet to the spillway under Jenks Street was not visible. It appears to be clogged with debris. The outlet is a granite block channel about 6 feet wide and 3 feet deep. Water drops about 8 feet from the outlet to a rock-lined channel. Large trees are growing on the dam.

Ownership
and
Use:

Existing Site BL-6716(Jenks Reservoir)

Location: On an unnamed tributary to the Peters River about 600 feet upstream from the confluence with the Peters River in Bellingham, Mass.

Franklin, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>30</u>	<u>6</u>	<u>600</u>	<u>0.9</u>

Potential for Expansion: It appears that the reservoir level could be raised about 10 feet. Lake Street and one house would be affected. The small drainage area limits expansion potential.

Remarks: The dam is an earthfill structure with a dike. The spillway on the right abutment has deteriorated and is not functioning. The spillway on the left abutment is a concrete weir with flashboards. The weir is about 5 feet long and 2 feet deep. Water has eroded the fill adjacent to the spillway on the right abutment and is flowing across the fill. The control gate on the right spillway is not operating.

Ownership and Use: The reservoir water rights are owned by Providence and Pawtucket Mill Company. The town of Bellingham owns land on the east shore of the reservoir. The reservoir is used for recreation.

***** **

Existing Site BL-6717(Lake Hiawatha)

Location: On Quick Stream Brook at Lake Shore Drive in Blackstone, Mass. The major portion of the reservoir is in Bellingham, Mass.

Blackstone, and Franklin, Mass.-R.I. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>60</u>	<u>10</u>	<u>750</u>	<u>1.2</u>

Potential for Expansion: Extensive lakeside development limits potential.

Remarks: Lake Shore Drive forms the dam. The spillway system consists of three pipes. Two one-foot diameter pipes carry base flow. A three-foot by 4.5 foot pipe arch carries excess flows.

Ownership and Use: The lake is owned by the Lake Hiawatha Association and is used for recreation.

Existing Site BL-6718(Harris Pond)

Location: On the Mill River at the Rhode Island-Massachusetts state line in Blackstone, Mass.

Blackstone, Mass. USGS quadrangle

Surface Area (Acres)	Height of Dam(Ft.)	Drainage Area (Acres)	Sq. Mi.
<u>90</u>	<u>30</u>	<u>21,700</u>	<u>33.9</u>

Potential for Expansion: The pond is surrounded by streets, houses, cemeteries, and a railroad which would be affected by expansion.

Remarks: The dam is an earthfill structure with riprap on the upstream slope. The spillway is a series of weirs. Water enters through two bays, each about 75 feet wide and 10 feet deep; then passes over a concrete ogee weir dropping about 6 feet to a series of 3 weirs. There is also a gate-controlled 30-inch diameter cast iron pipe spillway. The dam and spillways are in excellent condition.

Ownership and Use: The pond is owned by the City of Woonsocket, Rhode Island and is used as a water supply.



BL-6707
North Pond



BL-6712



BL-6710
Mill Pond



BL-6713
Lakeview Pond



BL-6711
Hopedale Pond

EXISTING RESERVOIRS
SUEWATERSHED BL-67
MILL RIVER





BL-6714
Silver Lake



BL-6717
Lake Hiawatha



BL-6715
Hales Pond



BL-6718
Harris Pond



BL-6716
Jenks Reservoir

EXISTING RESERVOIRS
SUBWATERSHED BL-67
MILL RIVER







LEGEND

- WATERSHED BOUNDARY
- DRAINAGE AREA ABOVE STRUCTURE
- POTENTIAL SITE SHOWING BENEFICIAL POOL FOR LARGEST STRUCTURE
- EXISTING POND OR RESERVOIR

Source - USGS Quad Sheets
Blackstone - 1969
Franklin - 1964
Millford - 1968



MILL RIVER (BL-67)
BLACKSTONE STUDY AREA
MASSACHUSETTS
EXISTING AND POTENTIAL RESERVOIR SITES
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

POTENTIAL SITE BL-6803

Location: On an unnamed tributary to Miscoe Lake about 1,500 feet upstream of the Rhode Island-Massachusetts state-line in Wrentham, Mass.

Franklin, Mass.-Rhode Island USGS quadrangle

Latitude: 42°01'19" Longitude: 71°25'29"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	House	270
	Kennel	265
	Barn	260
	Spring Street	255

Geologic Conditions: The left abutment is poorly graded outwash sand and gravel. The right abutment is glacial till, shallow to bedrock. Depth to bedrock in the foundation is estimated to be from 15 to 20 feet. Waterholding capabilities appear to be fair. Leakage is expected through the left abutment. Borrow material for dam construction was located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6804

Location: On Burnt Swamp Brook about 150 feet upstream of the Massachusetts-Rhode Island state-line in Wrentham, Mass.

Franklin, Mass-Rhode Island USGS quadrangle

Latitude: 42°01'08" Longitude: 71°23'28"

Facilities	<u>Facility</u>	<u>Elevation</u>
Affected:	4 Houses	250
	3 Sheds	250
	Hancock Street	250
	House	245
	Shed	245
	Burnt Swamp Road	245

Geologic Conditions: The left abutment is glacial till. The right abutment is granitic bedrock. Depth to granitic bedrock in the foundation is estimated to be from 10 to 15 feet. Waterholding capabilities appear to be fair. Leakage is expected through the foundation. Borrow material for dam construction was located near the site.

Engineering Notes: The right abutment is recommended for the excavated emergency spillway location.

POTENTIAL SITE BL-6808

Location: On Burnt Swamp Brook about 300 feet upstream of West Street in Wrentham, Mass.

Franklin, Mass.-Rhode Island USGS quadrangle

Latitude: 42°02'24"

Longitude: 71°22'47"

Facilities Affected:	<u>Facility</u>	<u>Elevation</u>
	House	280
	Franklin Street	280
	4 Houses	275
	House	270
	Bennett Street	270
	Chestnut Street	270

Geologic Conditions: The left abutment is glacial till. The right abutment is glacial outwash. Depth to bedrock in the foundation is estimated to be from 15 to 25 feet. Waterholding capabilities appear to be fair. Leakage is expected through the right abutment. Borrow material for dam was located near the site.

Engineering Notes: The left abutment is recommended for the excavated emergency spillway location.

SUMMARY DATA FOR POTENTIAL UPSTREAM RESERVOIR SITES

STUDY AREA- BLACKSTONE RIVER SUBWATERSHED BURNT SWAMP BROOK
BENEFICIAL POOL

ELEV	STORAGE	AC FT	IN	COST PER AC FT	DEPTH AT DAM	CREST ELEV	STORAGE AT CREST	COST PER AC FT	DESIGN HIGH WATER	DAM	SAFE YIELD
(MSL)	AC FT	IN		(\$)	(FT)	++ TYPE	AT CREST	(\$)			AT 95
243.7	0	0.0		5	1.7	252.7 E	155	4.1	255.2	34	9
250.8	100	2.7		23	8.8	253.3 E	172	4.6	255.7	35	9
254.3	195	5.1		32	12.3	256.9 E	289	7.6	259.2	44	14
259.4	386	10.3		44	17.4	261.9 E	510	13.7	264.2	55	24
262.5	537	14.3		51	20.5	265.0 E	678	18.2	267.1	62	35

DA= 0.70 SQ MI = 448 AC USGS QUAD- FRANKLIN
SITE-BL-6803
STREAM WATER QUALITY (B) 100-YR PRIN SPWY DESIGN STORM RUNOFF = 6.30 IN, PEAK FLOW = 252 CFS
LATITUDE 42-01-19 LONGITUDE 71-25-29

ELEV	STORAGE	AC FT	IN	COST PER AC FT	DEPTH AT DAM	CREST ELEV	STORAGE AT CREST	COST PER AC FT	DESIGN HIGH WATER	DAM	SAFE YIELD
(MSL)	AC FT	IN		(\$)	(FT)	++ TYPE	AT CREST	(\$)			AT 95
243.7	0	0.0		5	1.7	252.7 E	155	4.1	255.2	34	9
250.8	100	2.7		23	8.8	253.3 E	172	4.6	255.7	35	9
254.3	195	5.1		32	12.3	256.9 E	289	7.6	259.2	44	14
259.4	386	10.3		44	17.4	261.9 E	510	13.7	264.2	55	24
262.5	537	14.3		51	20.5	265.0 E	678	18.2	267.1	62	35

DA= 4.60 SQ MI = 2944 AC USGS QUAD- FRANKLIN
SITE-BL-6804
STREAM WATER QUALITY (B) 100-YR PRIN SPWY DESIGN STORM RUNOFF = 6.30 IN, PEAK FLOW = 1336 CFS
LATITUDE 42-01-08 LONGITUDE 71-23-28

ELEV	STORAGE	AC FT	IN	COST PER AC FT	DEPTH AT DAM	CREST ELEV	STORAGE AT CREST	COST PER AC FT	DESIGN HIGH WATER	DAM	SAFE YIELD
(MSL)	AC FT	IN		(\$)	(FT)	++ TYPE	AT CREST	(\$)			AT 95
239.2	0	0.0		37	1.2	245.5 E	1018	4.1	249.0	445	16
240.7	100	0.4		91	2.8	240.7 N	137	0.6	248.2	407	14
245.5	986	4.0		292	7.5	248.0 E	1891	7.6	251.2	510	39
250.1	2759	11.2		487	12.1	252.6 E	4086	16.7	254.5	579	56
252.5	4009	16.2		537	14.5	255.0 E	5456	22.2	256.6	621	77

DA= 1.30 SQ MI = 832 AC USGS QUAD- FRANKLIN
SITE-BL-6808
STREAM WATER QUALITY (B) 100-YR PRIN SPWY DESIGN STORM RUNOFF = 6.30 IN, PEAK FLOW = 469 CFS
LATITUDE 42-02-24 LONGITUDE 71-22-47

ELEV	STORAGE	AC FT	IN	COST PER AC FT	DEPTH AT DAM	CREST ELEV	STORAGE AT CREST	COST PER AC FT	DESIGN HIGH WATER	DAM	SAFE YIELD
(MSL)	AC FT	IN		(\$)	(FT)	++ TYPE	AT CREST	(\$)			AT 95
260.7	0	0.0		9	2.7	267.2 E	288	4.1	269.6	101	12
264.2	100	1.4		46	6.3	266.7 E	259	3.6	269.2	97	12
267.1	272	3.9		76	9.1	269.6 E	502	7.1	272.0	117	17
270.7	615	8.8		110	12.8	273.2 E	919	13.2	275.6	137	27
272.5	813	11.7		120	14.5	275.0 E	1141	16.5	277.0	145	31

DA= 1.30 SQ MI = 832 AC USGS QUAD- FRANKLIN
SITE-BL-6808
STREAM WATER QUALITY (B) 100-YR PRIN SPWY DESIGN STORM RUNOFF = 6.30 IN, PEAK FLOW = 469 CFS
LATITUDE 42-02-24 LONGITUDE 71-22-47

NOTES - (1) COSTS ARE BASED ON 1974 S.C.S. DESIGN CRITERIA AND COST DATA.
(2) EMERGENCY SPILLWAY STORAGE AND COSTS ARE BASED ON TOTAL STORAGE, INCLUDING BENEFICIAL POOL.
(3) EMERGENCY SPILLWAY TYPE CODE- C=CONCRETE CHUTE, D=CONCRETE DROP, E=EXCAVATED, T= TWO SPILLWAYS, N= NONE
(4) TABULAR DATA ARE BASED ON PRELIMINARY INFORMATION. FIGURES SHOWN ARE PRIMARILY FOR COMPARISON PURPOSES.
(5) ELEVATIONS ARE SHOWN TO THE NEAREST 0.1 FOOT TO SHOW VARIATION BETWEEN DEVELOPMENTS ONLY, AND ARE NOT TO BE CONSIDERED ACCURATE TO THAT DEGREE.

** DO NOT USE FOR FINAL SITE SELECTION OR LAND ACQUISITION. **



LEGEND

- WATERSHED BOUNDARY
- DRAINAGE AREA ABOVE STRUCTURE
- POTENTIAL SITE SHOWING BENEFICIAL POOL FOR LARGEST STRUCTURE
- EXISTING POND OR RESERVOIR

ABBOTT RUN (BL-68)
 BLACKSTONE STUDY AREA
 MASSACHUSETTS
 EXISTING AND POTENTIAL RESERVOIR SITES
 UNITED STATES DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE

Source - USGS Quad Sheets
 Franklin, Mass - 1964
 Medfield, Mass - 1957
 Pawtucket, RI - 1949
 Attleboro, Mass - 1964

MUNICIPAL INDEX OF RESERVOIR SITE DATA

<u>City or Town</u>	<u>Site No.</u>	<u>Narrative Information Page</u>	<u>Design Summary Page</u>
Auburn	BL-6109	12	16
	6110	12	17
	6111	13	17
	6122	22	
	6123	23	
	6124	23	
	6127	25	
	6129	26	
	6204	32	36
Bellingham	BL-6706	136	138
	6713	142	
	6714	142	
	6716	143	
	6717	144	
Blackstone	BL-6422	70	77
	6424	78	
	6703	134	137
	6717	144	
	6718	144	
Boylston	BL-6301	49	53
	6302	50	53
Douglas	BL-6401	61	71
	6402	62	71
	6404	62	71
	6405	63	72
	6406	63	72
	6407	64	72
	6408	64	73
	6410	65	73
	6412	65	74
	6413	66	74
	6428	80	
	6509	85	94
	6511	86	95
	6513	86	95
	6514	87	95
	6515	87	96
	6517	88	96
	6519	90	97
	6520	90	97
	6522	91	98
	6523	91	98
	6533	103	

MUNICIPAL INDEX OF RESERVOIR SITE DATA

<u>City or Town</u>	<u>Site No.</u>	<u>Narrative Information</u> <u>Page</u>	<u>Design Summary</u> <u>Page</u>
Douglas (cont'd.)	BL-6535	104	
	6536	105	
	6537	105	
	6538	106	
	6539	106	
Grafton	BL-6206	32	36
	6207	33	37
	6208	33	37
	6311	52	54
	6312	52	55
	6315	57	
	6316	57	
	6317	58	
	6318	58	
	6319	59	
	6320	59	
	6321	60	
	6603	111	122
	6610	114	123
	6627	128	
	6628	128	
Holden	BL-6114	18	
	6115	18	
Hopedale	BL-6710	140	
	6711	141	
	6712	141	
Hopkinton	BL-6707	139	
Leicester	BL-6130	26	
	6131	27	
	6132	27	
	6133	28	
	6134	28	
	6135	29	
	6136	29	

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<u>City or Town</u>	<u>Site No.</u>	<u>Narrative Information</u> <u>Page</u>	<u>Design Summary</u> <u>Page</u>
Mendon	BL-6617	117	125
	6621	118	126
	6623	119	126
	6626	121	127
	6701	133	137
	6702	134	137
	6704	135	138
Milford	BL-6705	135	138
	6707	139	
	6708	139	
	6709	140	
	6710	140	
Millbury	BL-6103	10	15
	6106	11	16
	6112	14	17
	6125	24	
	6126	24	
	6206	32	36
	6217	40	
	6218	41	
	6219	41	
	6220	42	
	6221	42	
	6222	43	
	6223	43	
	6224	44	
Northbridge	BL-6423	78	
	6502	81	92
	6524	99	
	6526	100	
	6527	100	
	6528	101	
	6529	101	
Oxford	BL-6540	107	
Paxton	BL-6137	30	

MUNICIPAL INDEX OF RESERVOIR SITE DATA

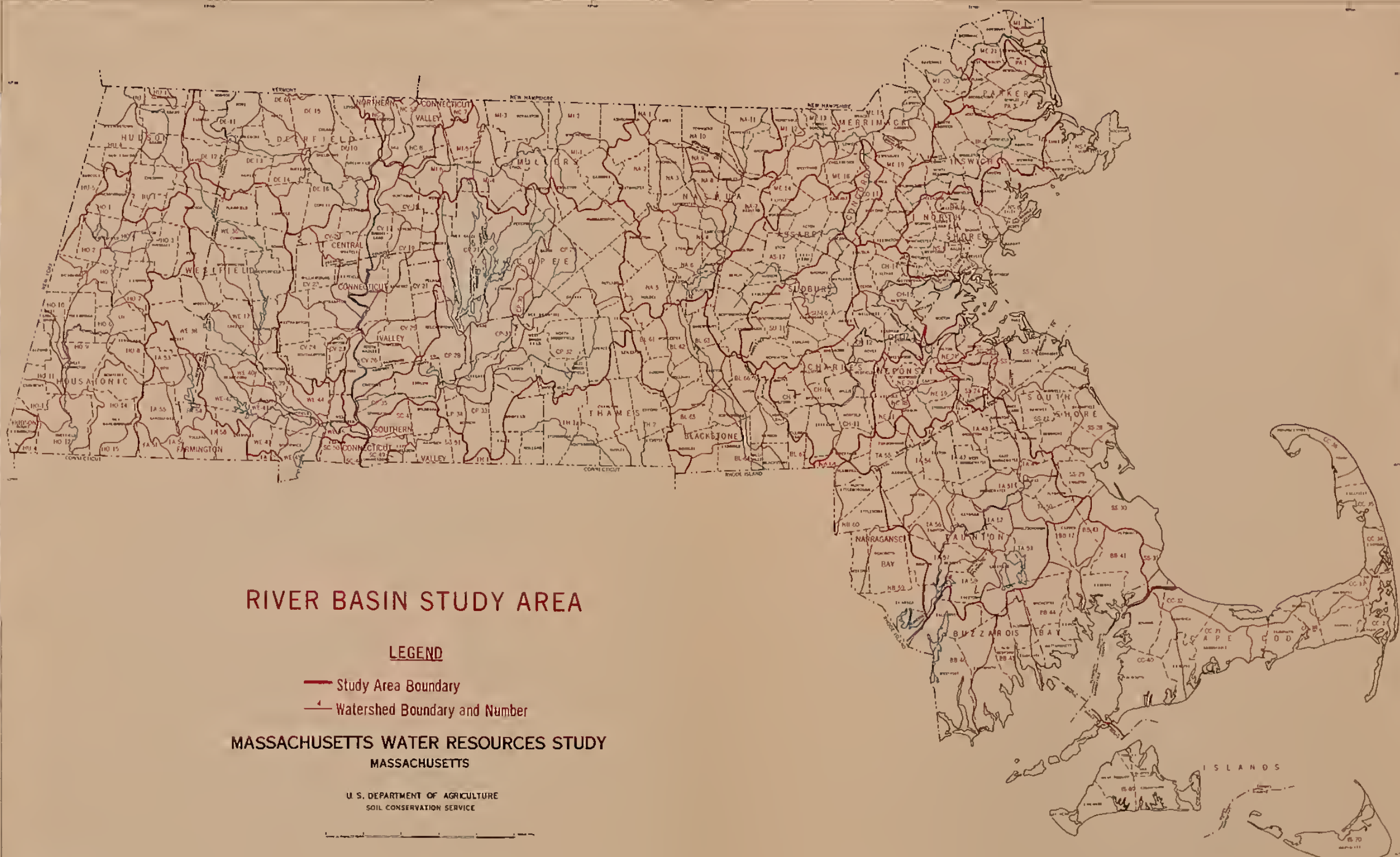
<u>City or Town</u>	<u>Site No.</u>	<u>Narrative Information</u>	<u>Design Summary</u>
		<u>Page</u>	<u>Page</u>
Shrewsbury	BL-6306	51	54
	6310	51	54
	6313	56	
	6314	56	
	6315	57	
Sutton	BL-6104	10	15
	6126	24	
	6209	34	37
	6212	34	38
	6213	35	38
	6225	44	
	6226	45	
	6227	45	
	6228	46	
	6229	46	
	6230	47	
	6231	47	
	6233	48	
	6234	48	
	6503	82	92
	6504	82	92
	6505	83	93
	6506	83	93
	6507	84	93
	6508	84	94
	6510	85	94
	6525	99	
	6534	104	
	6539	106	
	6541	107	
	6542	108	
	6543	108	
	6544	109	
	6545	109	
	6546	110	
Upton	BL-6604	112	122
	6606	112	122
	6607	113	123
	6609	113	123
	6611	114	124
	6612	115	124
	6613	116	124
	6614	116	125

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<u>City or Town</u>	<u>Site No.</u>	<u>Narrative Information Page</u>	<u>Design Summary Page</u>
Upton (cont'd.)	BL-6629	129	
	6630	129	
	6631	130	
	6632	130	
	6705	135	138
	6708	139	
Uxbridge	BL-6414	66	74
	6415	67	75
	6416	67	75
	6417	68	75
	6419	68	76
	6420	69	76
	6421	69	76
	6423	78	
	6425	79	
	6426	79	
	6427	80	
	6516	88	96
	6518	89	97
	6528	101	
	6530	102	
	6531	102	
	6532	103	
	6620	118	125
	6622	119	126
	6624	120	127
	6625	120	127
	6633	131	
	6634	131	
	6635	132	
Webster	BL-6509	85	94
Worcester	BL-6102	9	15
	6116	19	
	6117	20	
	6118	20	
	6119	21	
	6120	21	
	6121	22	
	6122	22	
	6202	31	36

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<u>City or Town</u>	<u>Site No.</u>	<u>Narrative Information Page</u>	<u>Design Summary Page</u>
Worcester (cont'd.)	BL-6214	39	
	6215	39	
	6216	40	
	6303	50	53
	6315	57	
Wrentham	BL-6715	143	
	6803	146	148
	6804	146	148
	6808	147	148



RIVER BASIN STUDY AREA

LEGEND

- Study Area Boundary
- - - Watershed Boundary and Number

MASSACHUSETTS WATER RESOURCES STUDY

MASSACHUSETTS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

JULY 1971



